MEDICAL EDUCATION in the SOVIET UNION

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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MEDICAL EDUCATION in the SOVIET UNION

Report of the
Delegation on Medical Education
under the
US-USSR Cultural Exchange Agreement
October 20-November 8, 1963

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of the Secretary
Washington, D. C.

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 Price 40 cents

FOREWORD

Interest in the Soviet Union's system of medical education is current among American educators concerned with the preparation of physicians and others in the health professions. This interest is appropriate since both societies are faced with comparable challenges, particularly in the evaluation of existing programs and in the development of optimum relationships among the distinct functions of teaching, research, and service in the health sciences.

This report covers the observations and findings of the American Delegation on Medical Education under the US-USSR Cultural Exchange Agreement, together with brief descriptions of institutions visited. It is addressed to those in our Nation's educational and health institutions who wish to know more about existing approaches to education and training for the health professions in other countries. Information about the USSR program gives additional perspective on health services in a large, rapidly growing industrial society.

During the visits, the Delegation answered many questions on medical education and related activities in the United States. Visits by counterpart representatives of the Union of Soviet Socialist Republics to study our approaches and achievements in this area would contribute further to the increased mutual understanding sought through the Cultural Exchange Agreements.

June 15, 1964

Boisfeuillet Jones

BOISFEUILLET JONES
CHAIRMAN OF DELEGATION

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INTRODUCTION

EXCHANGE MISSIONS between the United States and the Union of Soviet Socialist Republics in medicine and the biological sciences have been in effect for the past eight years (1956–63). The first Soviet delegation visited the United States in January 1956 to study poliomyelitis research. The US reciprocal delegation on microbiology and epidemiology visited the Soviet Union in February and March 1956.[1] The second exchange mission occurred in 1957. The US delegation visited the USSR in August and September,[2] and the Soviet reciprocal delegation visited the United States in October and November.

The first 2-year US-USSR Exchange Agreement was signed on January 27, 1958. This agreement provided for exchanges of delegations and individuals in the scientific, technical, education, cultural, and other fields. The second agreement was signed on November 21, 1959, for the years 1960 and 1961. The third 2-year agreement was signed on March 8, 1962, and stipulated in section V that one of the eight US delegations would study the results attained in medical education in the Soviet Union.

The Delegation on Medical Education surveyed institutions in the Soviet Union concerned with medical education from October 21 to November 8, 1963. During the survey there were discussions with Soviet medical educators and health officials as well as visits to teaching facilities for the clinical and basic sciences, universities, research institutes, and schools for paramedical education.

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[1] United States-U.S.S.R. Medical Exchange Missions, 1956, Public Health Monograph No. 50, 1957.

[2] The Report of the United States Public Health Mission to the Union of Soviet Socialist Republics, 1957, Public Health Service Publication No. 649, 1959.

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This report presents information gathered by the members of the delegation and discusses their general impressions of medical education in the Soviet Union. Attempts have been made to verify the data included herein by consulting published literature on medical education and health services in the Soviet Union. If inconsistencies or inaccuracies persist, the Delegation requests indulgence; errors of omission or commission are unintentional.

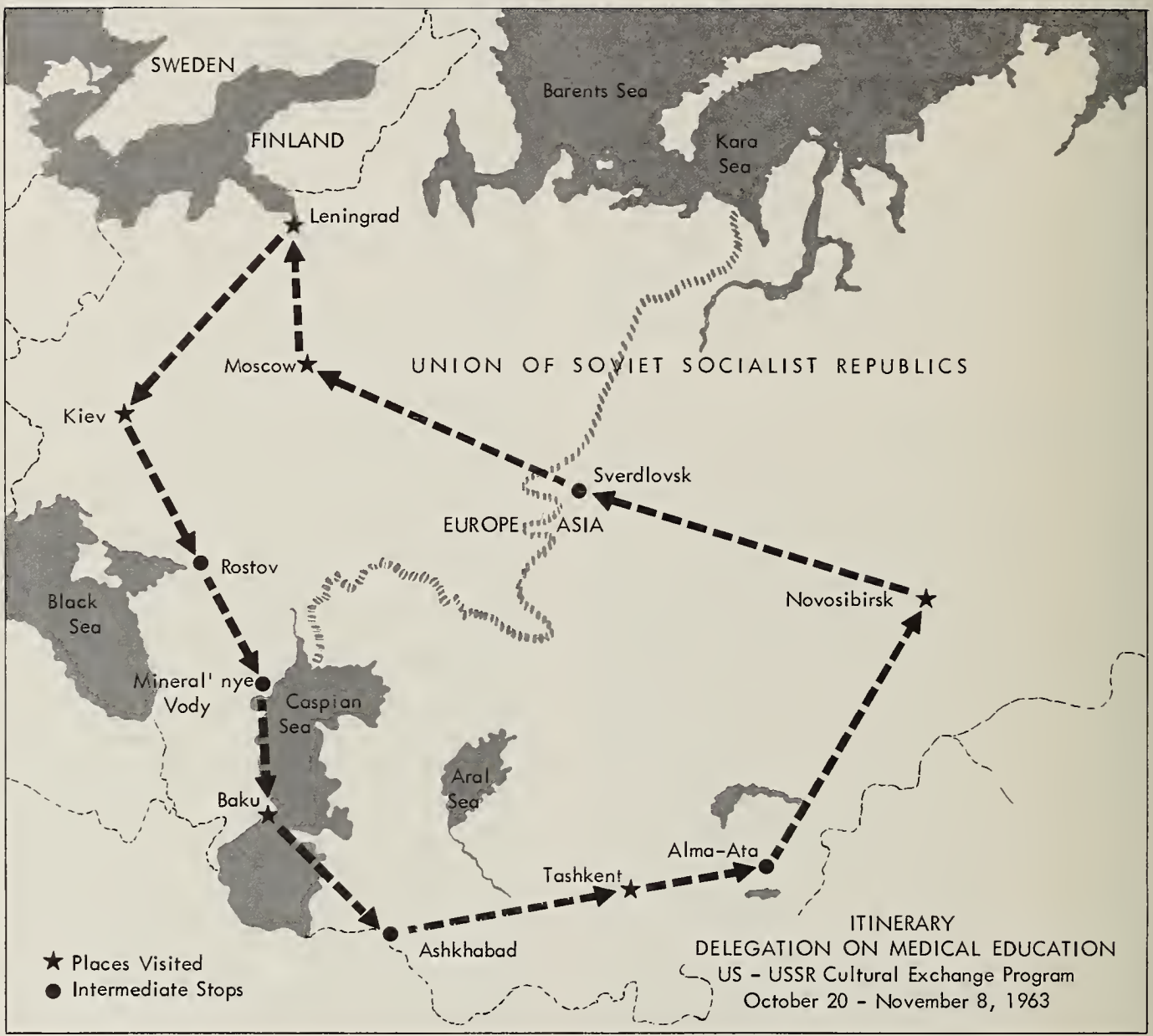
Acknowledgements

The English spelling of Russian names and other proper nouns frequently varies because of differences in transliteration from the Cyrillic to the Roman alphabet. In an effort to achieve consistency, *The Current Digest of the Soviet Press*, published weekly at Columbia University by the Joint Committee on Slavic Studies appointed by the American Council of Learned Societies and the Social Science Research Council, has been consulted as an authoritative source. Its transliteration table is the basis for the spelling of Russian names and titles in this report.

The members of the Delegation wish to take this opportunity to express their appreciation to the USSR Ministry of Health, and to the Soviet medical educators and scientists who contributed toward the success of the mission. The opportunity to visit and exchange ideas with colleagues in the USSR will be remembered by each member of the Delegation as an informative and stimulating experience.

Particular gratitude is due Madame Marina N. Modestova of the USSR Academy of Medical Sciences, who served as interpreter, and Docent Victor A. Babichev of the Second Moscow Medical Institute, who accompanied the Delegation as the representative of the USSR Ministry of Health. They were energetic and gracious in their many efforts to make the visits as rewarding as possible.

Several individuals have significantly assisted the Delegation in the preparation of this report. Miss Lucy M. Kramer, of the Division of Community Health Services, collated and edited the original notes and drafts of the report. Mr. Alexander G. Korol of the Center for International Studies, Massachusetts Institute of Technology, provided extremely helpful criticism of preliminary drafts in addition to suggesting appropriate source material. Mr. Samuel B. Webb, Jr., also of the Division of Community Health Services, prepared the curriculum charts. Translations of certain materials brought back by the Delegation were made by the Translating Unit, Division of Research Services, National Institutes of Health. The list of medical institutes was prepared by the Eastern European Unit, Comparative Education Branch, Division of International Studies and Services, Office of Education. The typing of several drafts was completed with accuracy and dispatch by Mrs. Selma Freedman and Mrs. Kay Hennessey of the Public Health Service. To each of the aforementioned, the Delegation offers its sincere thanks.


SWEDEN
FINLAND
Barents Sea
Kara Sea
Leningrad
Moscow
UNION OF SOVIET SOCIALIST REPUBLICS
Kiev
Sverdlovsk
EUROPE
ASIA
Rostov
Novosibirsk
Black Sea
Mineral' nye Vody
Caspian Sea
Aral Sea
Baku
Alma-Ata
Tashkent
Ashkhabad
★ Places Visited
● Intermediate Stops
ITINERARY
DELEGATION ON MEDICAL EDUCATION
US - USSR Cultural Exchange Program
October 20 - November 8, 1963

ITINERARY

1963

October 20—Arrived Moscow 2130

October 21—USSR Ministry of Health
Moscow Paramedical School №18

October 22—First Moscow Medical Institute im. I. M. Sechenov
Institute and Clinic of Surgery
Clinic of Children's Diseases
Chair of Histology and Embryology
Chair of Microbiology

October 23—Central Institute for Advanced Training of Physicians
—Moscow City Hospital №67
Department of Proctology, Institute of Oncology im. P. A. Gertsen

October 24—Institute of Surgery im. A. V. Vishnevskiy
—Departed Moscow 2150
—Arrived Leningrad 2250

October 25—Leningrad Electrotechnical Medical School
—Leningrad Medical Pediatric Institute
Chair of Biochemistry
Chair of Embryology

October 26—Leningrad Sanitation-Hygiene Medical Institute
Chair of Labor Hygiene and Clinic of Occupational Diseases
Chair of Normal Physiology
Central Laboratory
—Clinic of Hospital Surgery, First Leningrad Medical Institute
—Chair of Anatomy and Histology, Leningrad University

October 27—Sunday
—Departed Leningrad 1740
—Arrived Kiev 1920

October 28—Kiev Medical Institute im. A. A. Bogomol'yets
Chair of Normal Anatomy
Chair of Biology
Chair of Histology and Embryology
Chair of Therapeutic Stomatology
—Ukrainian Ministry of Health

October 29—Kiev Rayon Hospital
Chair of Therapy
Chair of Obstetrics and Gynecology
—Research Institute of Clinical Medicine im. M. D. Strazhesko

October 30—Departed Kiev 0830
—Arrived Baku 1515 (lost 1 hour)
—Azerbaidzhan Ministry of Health

October 31—Azerbaidzhan State Medical Institute im. N. Narimanov
—Pediatric Hospital im. Chernomordnikov
—Baku City Clinic Hospital №4
Chair of Pathological Morphology
—Azerbaidzhan Paramedical School №1

November 1—Departed Baku 1130
—Arrived Tashkent 1645 (lost 2 hours)
—Uzbekistan Ministry of Health

November 2—Tashkent Textile Combine
Hospital and Polyclinic
Sanitary-Epidemic Stations
—Tashkent Medical Institute
Chair of Internal Diseases
Chair of Hospital Surgery
—Tashkent Institute for Advanced Training of Physicians

November 3—Sunday
—Tashkent Infectious Disease Hospital №1

November 4—Departed Tashkent 1330
—Arrived Novosibirsk 1915 (lost 1 hour)
—Science City

November 5—Institute of Experimental Biology and Medicine
—Institute of Cytology and Genetics
—Novosibirsk University
Faculty of Natural Sciences
—Departed Novosibirsk 1430
—Arrived Moscow 1545 (gained 4 hours)

November 6—USSR Ministry of Health
Chair of Normal Anatomy, First Moscow Medical Institute

November 7—Celebration of 46th Anniversary of the October Revolution

November 8—Departed Moscow 1730

I. HEALTH ORGANIZATION, MANPOWER, AND FACILITIES

The USSR Ministry of Health has overall responsibility for the organization, distribution, and provision of health services, for medical education, and for medical research (figure 1). Some medical institutes and research institutes are directly under the USSR Ministry of Health, or its main scientific body, the USSR Academy of Medical Sciences. Most of these institutions, however, are administratively responsible to the Ministries of Health of the respective union republics which in turn are responsible to the USSR Ministry of Health. The Delegation was informed that the total 1963 budget for health and physical culture in the Soviet Union was 5.3 billion rubles. This represents an increase over the budget of 4.9 billion rubles for 1962 and the budget of 5.0 billion rubles for 1961.[1]

According to the Soviet Yearbook, National Economy[2], there were 445,000 physicians and 1,478,500 paramedical workers in the Soviet Union at the end of 1962. The ratio of 198 physicians per 100,000 population is just short of the goal established by the USSR Ministry of Health of 210 physicians per 100,000 population. The most recent data on the numbers of physicians and paramedical personnel are shown below.[3] These figures exclude military personnel and are for the end of the year.

	1960	*1961*	*1962*
Physicians	402,000	426,000	445,000
Paramedical personnel	1,388,300	1,430,300	1,478,500

Approximately 45 percent of the paramedical personnel are nurses, 25 percent are feldshers, and 15 percent are midwives or feldsher-midwives. The remainder are technicians of various types.

The latest published figures available to the Delegation[4] on the number of health facilities in the Soviet Union list 26,812 hospital institutions, excluding military hospitals. The Delegation was informed by the USSR Ministry of Health that although there are 2,034,000 beds exclusive of those in health spas and military hospitals, for a ratio of 9.1 beds per 1,000 population, the Ministry had set a goal of 9.5 beds per 1,000 population by the end of 1963.

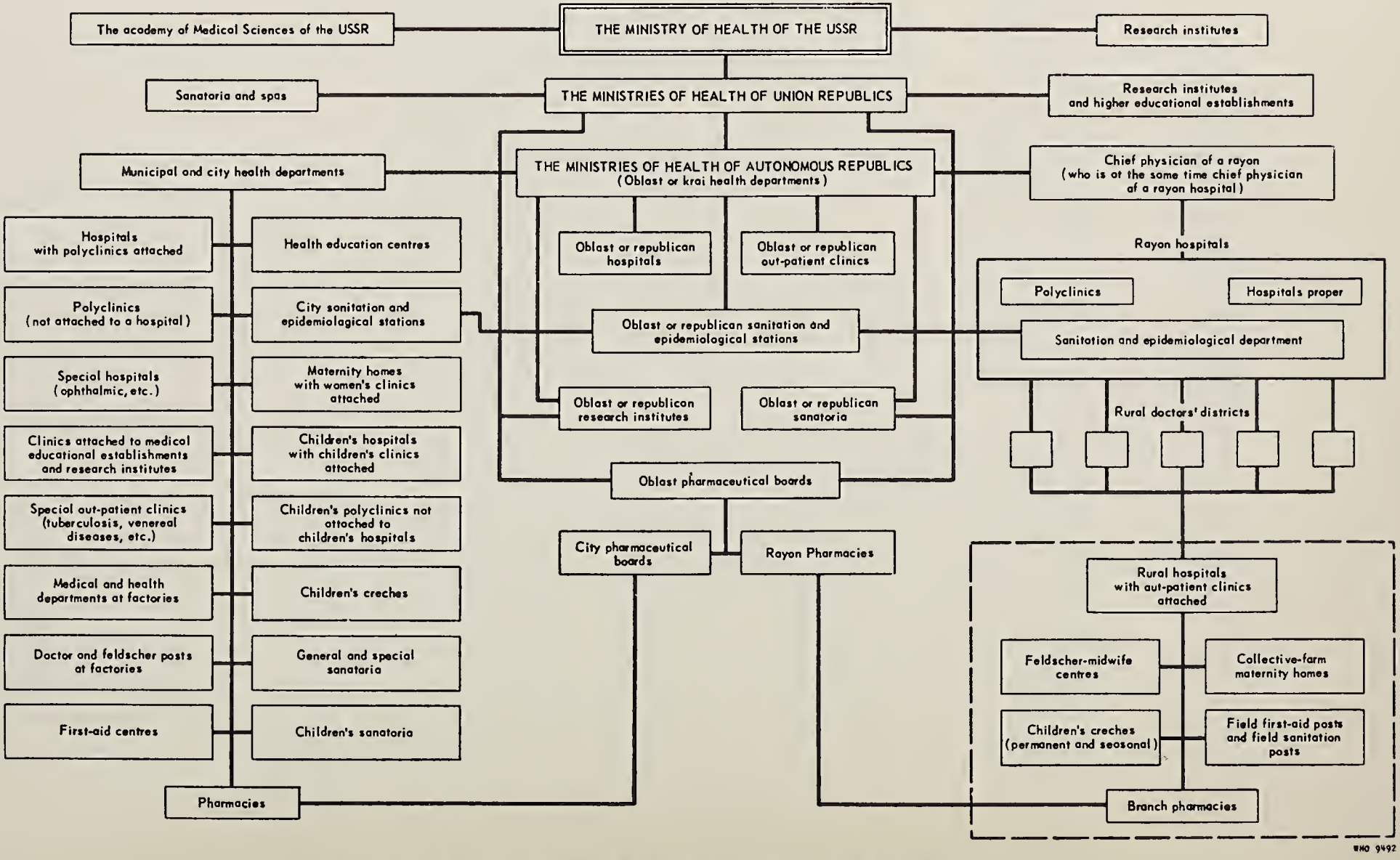
[1] Annual Economic Indicators for the U.S.S.R., Joint Economic Committee, Congress of the United States. Joint Committee Print, February 1964., p. 10[1].

[2] Narodnoye khozaistvo SSSR v 1962 godu, p. 615.

[3] *Ibid.*, p. 618.

[4] *Op. cit.*, v 1961 godu, p. 745

Figure 1 STRUCTURE OF THE HEALTH SERVICES IN THE USSR


The academy of Medical Sciences of the USSR
THE MINISTRY OF HEALTH OF THE USSR
Research institutes
Sanatoria and spas
THE MINISTRIES OF HEALTH OF UNION REPUBLICS
Research institutes and higher educational establishments
Municipal and city health departments
THE MINISTRIES OF HEALTH OF AUTONOMOUS REPUBLICS (Oblast or krai health departments)
Chief physician of a rayon (who is at the same time chief physician of a rayon hospital)
Hospitals with polyclinics attached
Health education centres
Oblast or republican hospitals
Oblast or republican out-patient clinics
Rayon hospitals
Polyclinics (not attached to a hospital)
City sanitation and epidemiological stations
Oblast or republican sanitation and epidemiological stations
Polyclinics
Hospitals proper
Sanitation and epidemiological department
Special hospitals (ophthalmic, etc.)
Maternity homes with women's clinics attached
Oblast or republican research institutes
Oblast or republican sanatoria
Rural doctors' districts
Clinics attached to medical educational establishments and research institutes
Children's hospitals with children's clinics attached
Oblast pharmaceutical boards
Special out-patient clinics (tuberculosis, venereal diseases, etc.)
Children's polyclinics not attached to children's hospitals
City pharmaceutical boards
Rayon Pharmacies
Rural hospitals with out-patient clinics attached
Medical and health departments at factories
Children's creches
Feldscher-midwife centres
Collective-farm maternity homes
Doctor and feldscher posts at factories
General and special sanatoria
Children's creches (permanent and seosonal)
Field first-aid posts and field sanitation posts
First-aid centres
Children's sanatoria
Pharmacies
Branch pharmacies
WHO 9492

Source: Health Services in the USSR. World Health Organization, Public Health Papers No. 3, 1960.

II. EDUCATION IN THE SOVIET UNION

Medical education is one of the types of higher education that the Soviet student may pursue after the successful completion of the program of primary-secondary general education. Other forms of higher education include programs offered in pedagogical institutes, engineering institutes, and agricultural institutes, in addition to the university programs in the arts and sciences.

A major reorganization of education in the Soviet Union is in progress. This commenced with legislation enacted by the Supreme Soviet on December 24, 1958, titled *Law on Strengthening the Ties of School with Life and on the Further Development of the System of Public Education in the USSR.* The Soviet government has expressed concern for the increasing numbers of students completing primary and secondary education —estimated at 1 to 1½ million annually— who were pursuing academic subjects solely and preparing for university entrance rather than taking vocational courses and programs oriented toward industry. The numbers of graduates of secondary programs have been exceeding the national quota for programs in higher education. Furthermore, students were said to have a disparaging attitude toward occupations requiring physical labor.

The new programs for secondary school increased the curricula from 7 years to 8 years for incomplete secondary education and from 10 years to 11 years for complete secondary education. A major emphasis was placed on industrial and vocational courses; the additional year in the curriculum entails mostly such courses. The schools are now referred to as "labor-polytechnic schools of general education." In addition, the educational plan calls for most students to work for 2 years before proceeding with higher education.

Admission to Medical Institutes

The Soviet student prepares for the study of medicine by completing 10 or 11 grades of primary and secondary general education between the ages of 7 and 18 years. Students who have certification of the satisfactory completion of their "maturity exams" are eligible to apply and take the entrance examinations for the medical institutes. Since the number of students desiring to study medicine far exceeds the quota for enrollment in the medical institutes, the competition is keen, and only about one out of four is accepted. The examinations are the primary criteria for selection; however, preference is given to students who have worked for 2 or more years in some branch of the economy.

There is a second path by which an individual may approach medical education in the Soviet Union. Students who have received training in paramedical institutes as nurses, midwives, or feldshers, may gain entrance to medical institutes. A student who has completed 7 or 8 grades of primary and secondary education is eligible to apply for admission to paramedical school. The top 5 percent of the graduates of paramedical schools are eligible to take entrance examinations for the medical institutes immediately upon graduation. After 2 years of employment, students who rank below this top 5 percent may seek entrance into medical schools via evening programs; after the completion of 3 years of service in their capacity as a paramedical worker, they may apply for

admission as day students. Approximately one-fifth of all medical students in the Soviet Union have had paramedical training of one form or another.

About three-fourths of all medical students receive stipends. Tuition is not charged in any of the Soviet educational programs. Thus it is claimed that all who are interested and found qualified may study to become physicians.

III. CHARACTERISTICS OF MEDICAL EDUCATION IN THE USSR

Prior to 1930, medical education in the Soviet Union was conducted within the structure of universities, usually as a faculty of medicine. At that time the decision was made to place this responsibility within the Ministry of Health in order to give impetus to the expansion of medical education programs and thus meet recognized health service needs. There are 85 institutions providing medical education in the Soviet Union. Eighty exist as independent medical institutes. In the five remaining institutions medical education is conducted by a medical faculty in a university. It was stated that medical institutes maintain contacts with universities, and close cooperation is the policy. The Delegation inquired but did not learn of any joint appointments between university and medical institute faculties.

The USSR Ministry of Health carries out overall planning for higher medical education and for "middle grade" or "paramedical" education. The medical curriculum is prepared centrally, and all institutes follow the unified plan. Advanced degrees and the development of new programs must be approved by the USSR Ministry of Health. The budgets of the medical institutes are allocated by the Republic Ministries of Health.

There is an average of one faculty member for each nine students for the 6-year curriculum. There are more teachers in the clinical subjects as compared to the preclinical disciplines.

Enrollments

There are 180,000 medical students in the Soviet Union. First enrollments are on the increase. Between 30,000 and 32,000 new students were accepted, and 25,000 medical students were graduated as physicians in 1963. Until recently, approximately 75 percent of medical students were females; this percentage has now declined to about 60 percent.

Organization of Medical Institutes[5]

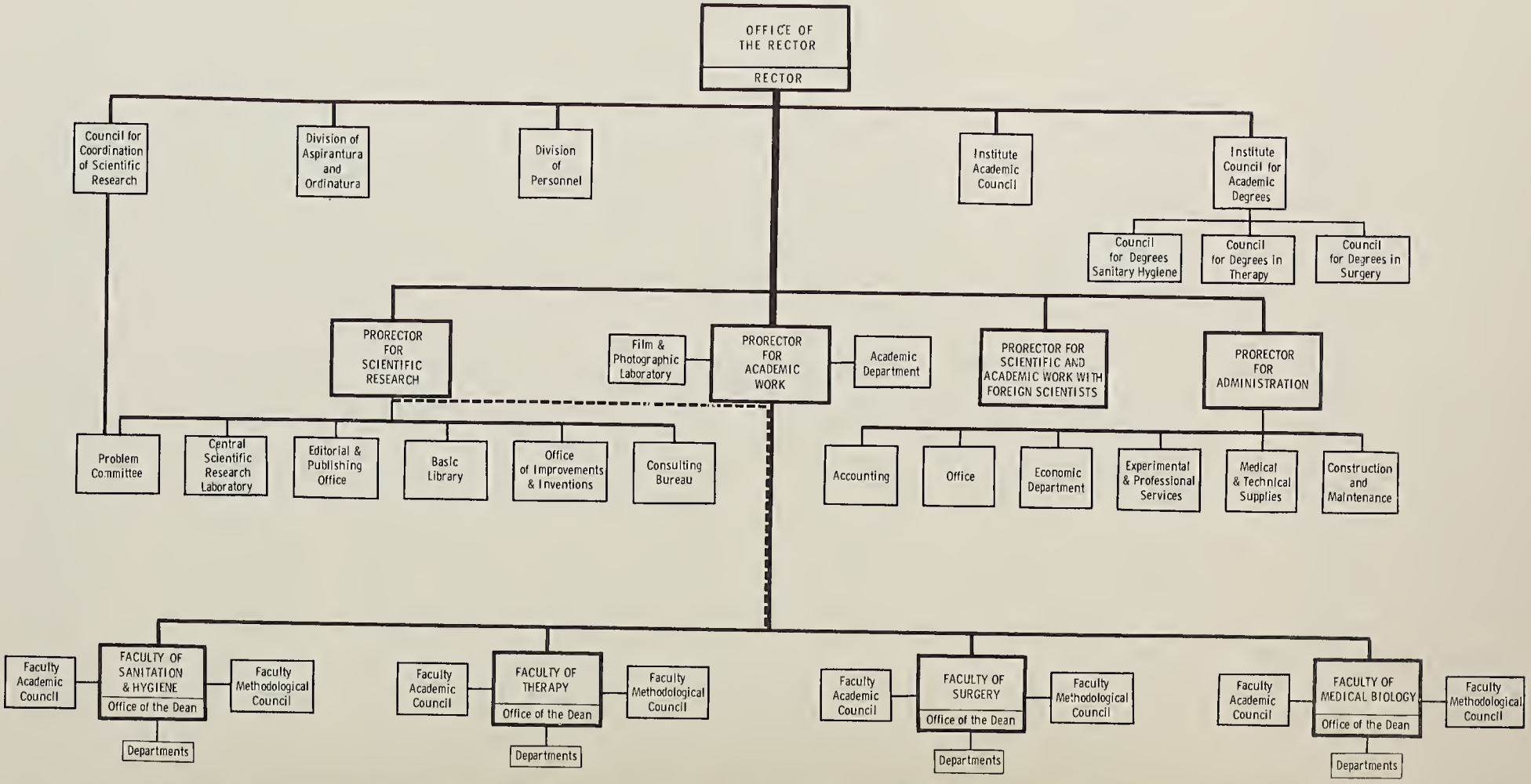
The head of a medical institute carries the title of rector. He is responsible for the administration and supervision of the institute. His responsibilities are shared with assistants who carry the title of pro-rector. In many cases they are responsible for specific activities within the institute; e.g., pro-rector for research, pro-rector for academic work, or pro-rector for administration.

The academic council of a medical institute acts as the executive council. This council is presided over by the rector and includes the pro-rectors, deans of faculties, heads of departments, several ranking professors, and other key personnel. This is the policy-setting body of the institute and is responsible for electing physicians to various faculty posts. In the larger institutes, this council elects only to the posts of professor and head of a department; the academic councils of the individual faculties, in turn, elect to the lesser faculty posts. In institutes with the privilege of granting advanced degrees, the institute's academic council must review the dissertation and approve the degree. All degrees are subject to approval by

[5] Figure 2, "Organization of the Central Institute for the Advanced Training of Physicians," is an adaptation of an organizational chart provided the Delegation by the Institute. The main features of organization are comparable to that found in most medical institutes.

Figure 2

ORGANIZATION OF THE CENTRAL INSTITUTE FOR THE ADVANCED TRAINING OF PHYSICIANS



Source: Translated from the Russian by the Translating Unit, Library Branch, Division of Research Services, National Institutes of Health, from organization chart furnished the Delegation by the Ministry of Health, USSR.

the Higher Attestation Commission (*VAK*) of the USSR Ministry of Higher and Secondary Specialized Education.

The major teaching and administrative unit of Soviet medical institutes is the faculty. A medical institute may have one or more faculties. Each faculty is headed by a dean and has its own academic council.

The deans are elected by the academic council of the faculty. Tenure is for 3 years. A dean may be re-elected; however, some faculty members decline to serve more than one term. The dean is responsible for the administrative affairs of the faculty.

Several individual disciplines, each organized as a department or chair (*kafedry*), constitute a faculty. Each chair has a head, usually a professor who serves as the chairman, and on occasion one additional professor, plus two or more docents, and a few assistants.

Faculty (Fakul'tet)

The Handbook for those Enrolling in Higher Educational Institutions of the USSR in 1963,[6] lists 176 separate daytime faculties in 80 medical institutes and 5 medical faculties of universities. The number and type of faculties are:

Therapy	75
Pediatric	33
Sanitation-Hygiene	21
Stomatology	29
Pharmacy	18
Total	176

An individual medical institute may have from one to five faculties. Of the 85 institutions conducting medical education, 36 have only 1 daytime medical faculty—26 therapy, 1 pediatric, 1 sanitation-hygiene, 2 stomatology, and 6 pharmacy. The remaining 49 institutions comprise 2 or more daytime faculties.

In medical institutes with faculties of therapy, pediatrics, and sanitation-hygiene, all students have their preclinical subjects together and then pursue specialized clinical training in one of the three faculties. Approximately 70 percent of Soviet medical students study in faculties of therapy, with 15 percent in each of the other two programs.

The majority of medical institutes have evening faculties in addition to the faculties for daytime study. There are 63 evening faculties for part-time study in the medical institutes and university medical faculties. They are of the following types:

Therapy	49
Pediatrics	9
Sanitation-Hygiene	1
Stomatology	3
Pharmacy	1
Total	63

These programs are for paramedical personnel who wish to study medicine on a part-time basis during the evenings. There are also correspondence courses offered by 12 stomatology faculties and 13 pharmacy faculties in various medical institutes.

Teaching Posts

An active involvement in scientific research is a prerequisite for a faculty appointment and advancement. Bright students in the medical institutes who demonstrate promise for future research achievements are identified and encouraged to pursue academic careers.

The first rung on the academic ladder is the position of assistant. These members of the faculty are responsible for teaching in the laboratory or at the bedside. Assistants who have not already done so often complete the requirements for the "candidate of medical science" degree after their appointment. In most medical institutes physicians who are engaged in graduate research training assume some teaching responsibilities as laboratory instructors during the final year of their program. The presentation of lectures is reserved for docents and professors.

The position of docent is intermediate between those of assistant and professor. Docents usually hold the degree "candidate

[6] Spravochnik dlya postupayushchikh, v. vysahie uchebnye zavedenia SSSR v 1963 godu. pp. 3-13 and pp. 79-83.

of medical science," and many are working on a dissertation to qualify for a "doctor of medical science" degree. The docent assists the professor with the main lecturing and other teaching responsibilities of the chair, and frequently does research related to the research interests of his professor.

When an assistant is being considered for a position as a docent, the presentation of a formal lecture before the academic council is one of the factors considered in the evaluation of his qualifications. The docent seeking promotion to the rank of professor also presents a formal lecture to the academic council.

There are usually only one or two professors in a chair. A professor ordinarily holds the degree "doctor of medical science." Physicians holding the highest posts in research institutes also carry the designation of professor. However, the intermediate personnel are titled "senior research worker" and beginning positions carry the designation "junior research worker."

The academic council elects faculty appointees and reviews their qualifications every 5 years. Theoretically, incumbents compete with others who have submitted applications for a post. Actually, there is little movement among the posts of docent and professor, and it is highly unusual for an incumbent not to be reappointed.

A title which carries more status and prestige than that of "professor" is that of "academician." This title can be used by the approximately 120 physicians who are elected corresponding members of the USSR Academy of Medical Sciences, and the approximately 140 physicians elected to active or full membership in this Academy. In addition to these forms of recognition, physicians are also eligible for election to the Academy of Sciences in the individual republics and to the USSR Academy of Sciences. The Delegation was unable to determine how many physicians are members of the USSR Academy of Sciences but received the impression that there are only a very few.

Salaries

A physician pursuing a career in academic medicine in the Soviet Union can reach high positions in terms of prestige, status, and economic rewards. A professor who holds the position of a head of a chair earns 500 rubles per month. Professors earn 450 rubles monthly. A docent's salary is 350 rubles per month.

These salaries contrast markedly with those earned by practitioners. A physician working in a hospital earns 95 rubles per month; the chief of service in a hospital has a salary of 125 rubles per month.

Election to corresponding or full membership in the USSR Academy of Medical Sciences carries an additional monthly honorarium. This amounts to 175 rubles for corresponding members, and 350 rubles for full members of the Academy.

IV. CURRICULA IN MEDICAL INSTITUTES

The curriculum in the medical institutes was extended from 5 to 6 years in 1955. Under the present curriculum structure, the first 2 years contain the basic sciences, the third year is primarily concerned with an introduction to clinical work, and the fourth, fifth, and sixth years vary, depending on the faculty -— therapy, pediatric, sanitation-hygiene—in which the student is enrolled.

The student assumes increasing clinical responsibilities during the fourth and fifth years; however, didactic lectures still represent a significant portion of the curriculum. The sixth year of the therapy curriculum resembles a rotating internship.

Curriculum Planning

The Department of Personnel and Higher Education, USSR Ministry of Health, has the responsibility for preparing the unified curriculum utilized by medical institutes throughout the Soviet Union. The plan includes 35 subjects in the therapy curriculum, 32 subjects in the pediatric curriculum, and 37 in the sanitation-hygiene curriculum; it also specifies the time to be allocated for lectures, laboratory work, and practice experience in each subject.

The plan is revised every 5 years. Proposals for changes in the curriculum can originate in either the Committees on Methodology in the USSR Ministry of Health, or on the part of a faculty committee within one of the medical institutes. As proposals are developed by the USSR Ministry of Health, they are circulated to all medical institutes for comment.

The final decision on the curriculum is made either by the Central Methodological Council for Higher Medical Education or, in some cases, by the Minister of Health, after review and advice by the Collegium of the Ministry. The curriculum must also be approved by the USSR Ministry of Higher and Specialized Secondary Education. Once the curriculum has been adopted, it is promulgated by distributing it through the Ministries of Health in the republics. These Ministries have the responsibility for supervising the implementation of the curriculum by the medical institutes. The curricula approved by the two Ministries in 1960 are presented in Appendix A.

Preclinical Subjects

All medical and stomatological students study the following basic sciences: physics; biology; human anatomy; histology and embryology; inorganic, analytical, organic, colloidal, physical, and biological chemistry; physiology; microbiology; pathology; and pharmacology. All but the final three of the aforementioned basic sciences are taught during the first and second years. Microbiology is taught in the second semester of the second year and the first semester of the third year; pathology and pharmacology are studied during both semesters of the third year. Approximately one-half of the hours scheduled for the basic sciences are utilized for lectures; the remainder are occupied with laboratory and practical exercises.

Courses in Marxism-Leninism (covering elements of history, economics, and the social sciences), foreign language, and physical culture are included in the preclinical curriculum. The student may elect additional work up to a level of 2 hours a week in a foreign language and 4 hours a

week of physical culture throughout all but the second semester of the final year.

Intermediate examinations in the basic sciences are given by State examination boards as follows: anatomy and histology—for all faculties except sanitation and hygiene—after the third semester; physiology and biological chemistry—for all faculties—after the fourth semester; and microbiology—for students in the sanitation-hygiene faculty—after the fifth semester.

Medical students are scheduled to work in clinics and hospitals as nurses' aides for six or eight evening sessions (6:00 p.m.–11:00 p.m.) per semester during the first 2 years. Students in the sanitation-hygiene program fulfill these requirements as junior medical personnel in "sanitary-epidemiological stations." During the third year, students perform similar services as intermediate medical personnel.

During the third year, the student begins his introduction to clinical work in medicine, surgery, and pediatrics. The second semester of the third year finds the student of stomatology beginning to concentrate on the diseases of the oral cavity; over one-fourth of his curriculum is occupied by therapeutic, orthopedic, and surgical stomatology. The hours scheduled for each subject in the curricula of the therapy, pediatric, sanitation-hygiene, and stomatology faculties are compared in table 1.

Clinical Years

Following an introduction to the clinical disciplines in the third year, the student embarks on increasingly intensive clinical work within a faculty of therapy, pediatrics, or sanitation-hygiene. The hours scheduled for each subject in the separate curricula are compared in table 2. There are only 2 years of study in the clinical disciplines in a faculty

TABLE 1. Comparison of Curricula for the Preclinical Years (1st, 2nd, and 3rd)

SUBJECTS	HOURS			
	Therapy	Pediatric	Sanitation Hygiene	Stomatology
Marxism-Leninism	353	353	354	355
Foreign Language	238	238	244	238
Physical Culture	134	134	138	134
Physics	152	152	176	152
Biology	172	172	176	172
Human Anatomy	376	376	295	359
Histology and Embryology.	182	182	153	182
Inorganic and Analytic Chemistry.	140	140	227	140
Organic and Biological Chemistry.	295	295	272	279
Physiology	246	246	255	247
Microbiology	207	207	248	191
Pathology	329	325	314	280
Pharmacology	170	174	141	121
Hygiene	90	90	145	48
Introduction to Clinical Work.				
Internal Medicine.	238	193	225	175
Surgery	234	234	185	204
Pediatrics	.....	45	.....	.....
Stomatology	.....	.....	.....	258
TOTAL	3,556	3,556	3,548	3,535

Source: Based on curricula presented in Appendix A.

TABLE 2. Comparison of Curricula for the Clinical Years (4th, 5th, and 6th)

SUBJECTS	HOURS		
	Therapy	Pediatric	Sanitation Hygiene
Internal Medicine	775	355	191
Surgery	835	422	194
Pediatric Surgery	.....	170	.....
Obstetrics-Gynecology	379	211	111
Pediatrics	166	731	140
Infectious Disease	214	140	167
Pediatric Infectious Disease.	.....	332	.....
Forensic Medicine, General Hygiene, and Organization of Public Health.	301	304	406
Ophthalmology, Otolaryngology, Dermatology.	269	276	201
Neurology and Psychiatry.	196	197	128
Occupational Disease and Labor Hygiene.	.....	.....	421
Nutrition	.....	.....	263
Hygiene of Children and Adolescents.	.....	.....	244
Epidemiology	.....	.....	392
Community Hygiene	.....	.....	333
Miscellaneous	86	90	72
TOTAL	3,221	3,228	3,263

Source: Based on curricula presented in Appendix A.

of stomatology rather than 3 years as is the case in the other faculties.

Many of the clinical chairs in the various medical institutes are based in rayon, city, or oblast hospitals, industrial polyclinics, and specialized clinical and research institutes. Medical institutes also have their own hospitals and clinics.

The "faculty course" and the "hospital course" in therapy, surgery, and pediatrics represent major components of the curriculum in the clinical years. A "faculty course" entails the systematic presentation of the symptoms, signs, laboratory findings, and differential diagnosis in the more common of the clinical entities. The curriculum time scheduled in "hospital therapy," "hospital surgery," or "hospital pediatrics" provides the student with the opportunity to learn the diagnosis and management of diseases more complicated than those commonly seen on an inpatient service.

Faculty of Therapy

Over 800 hours (approximately 40 percent of the curriculum time) in the fourth and fifth years are scheduled for the "faculty" and "hospital" courses in surgery and therapy. Pediatrics and obstetrics-gynecology are also major courses with an allocation of approximately 170 hours for each. Subjects related to public health (forensic medicine, hygiene, and public health organization) account for over 300 hours, as do the specialties of ophthalmology, otolaryngology, and dermatology. Psychiatry and neurology are scheduled for a total of almost 200 hours.

The sixth year is divided into four blocks of time for intensive clinical experience on hospital wards. The year is divided as follows:

Obstetrics and gynecology—
200 hours (6 2/3 weeks)
Hospital therapy—
350 hours (11 2/3 weeks)
Infectious disease—
150 hours (5 weeks)
Hospital surgery—
350 hours (11 2/3 weeks)

In addition to the subjects scheduled during the academic year, the student participates in field experiences during the summers. Four weeks are spent in the therapeutic and surgical divisions of remedial therapy institutions during the summer following the third year. The months of June and July between the fourth and fifth year are spent as "sub-ordinators," rather like externs, in the divisions of therapy, surgery, and obstetrics in rayon or oblast hospitals. During the summer following the fifth year, 4 weeks are spent in polyclinics and outpatient facilities as district physicians.

Faculty of Pediatrics

The intensive ward work is confined to the second semester of the sixth year in the curriculum of the faculty of pediatrics. Accordingly, lectures and small group demonstrations in the clinical fields encompass five of the six semesters in the curriculum for the clinical years.

Clinical work in medicine and surgery accounts for slightly less than 800 hours of the curriculum. Obstetrics-gynecology is scheduled for over 200 hours. Forensic medicine, hygiene, public health organization, ophthalmology, otolaryngology, dermatology, neurology, and psychiatry are allocated time comparable to that in the curriculum for the faculty of therapy.

Pediatric problems are emphasized during 430 hours scheduled for the "faculty" and "hospital" courses in pediatrics, 182 hours in infectious diseases of childhood, and 95 hours of pediatrics surgery. During the second semester of the sixth year, the student is assigned to hospital wards for intensive clinical work as follows:

Hospital pediatrics—
225 hours (7½ weeks)
Pediatric infectious disease—
150 hours (5 weeks)
Pediatric surgery—
75 hours (2½ weeks)

As in the therapy faculty, the summer field experiences scheduled in the pediatric faculty following the third year include 4 weeks in the therapeutic and surgical di-

visions of remedial institutions; the 8 weeks between the fourth and fifth years are spent as "sub-ordinators" in hospitals. During the 4 weeks following the fifth year, the student works as a regional pediatrician in polyclinics and outpatient facilities.

Faculty of Sanitation-Hygiene

Approximately 400 hours are spent in clinical medicine and surgery. This is about one-half of the time scheduled in these subjects by the therapy and pediatric faculties. Obstetrics-gynecology is studied for 111 hours. Ophthalmology, otolaryngology, and dermatology total approximately 200 hours, while neurology and psychiatry are allotted 125 hours. These compare with 300 hours and 200 hours respectively in the therapy curriculum.

Major courses are epidemiology—302 hours, community hygiene—243 hours, labor hygiene—267 hours, and public health organization—244 hours. The second semester of the sixth year is divided into the following five 3-week field assignments of 90 hours each: nutrition, epidemiology, labor hygiene, hygiene of children, and community hygiene.

Following the third year, the student spends 4 weeks during the summer as an "intermediate medical person" in an industrial setting. During the June and July between the fourth and fifth years, the student works in a "sanitary-epidemiologic station." The month of July after the fifth year is spent as an acting sanitation-hygiene specialist.

Faculty of Stomatology

After starting courses in stomatology during the third year, the student completes his preparation as a stomatologist in 2 additional years. The subjects in the therapy curriculum are taught in abbreviated form. Internal medicine and surgery total 452 hours; pediatrics and obstetrics-gynecology account for 110 hours; ophthalmology, otolaryngology, and dermatology receive 194 hours; a combined course in neurology and psychiatry is scheduled for 96 hours; and hygiene is taught for 126 hours.

The major subjects of orthopedic, therapeutic, and surgical stomatology total 746 hours—approximately 40 percent of the curriculum time in the fourth and fifth years. The student spends 8 weeks in a polyclinic during the summer between the fourth and fifth years as a "sub-ordinator" in these disciplines.

Faculty of Pharmacy

Although faculties of pharmacy are located in several medical institutes, the academic programs are separate from those in which physicians and stomatologists are being prepared. The delegation did not visit a faculty of pharmacy.

Evening and Correspondence Courses

Some medical institutes have evening faculties in which paramedical personnel can enroll to study therapy for 6½ years or stomatology for 6 years. The student can transfer to the full-time program, in either case, after 3 years of evening study. The evening curricula schedule 16 hours of classes per week as compared to the 30 to 34 hours per week in the full-time curricula.

Because of the shortage of stomatologists, a special correspondence curriculum has been developed to permit "dentists" (a

TABLE 3. State Examinations for a Diploma

Faculty	Therapy	Pediatrics	Sanitation-Hygiene	Stomatology
Subjects of the Examination	Marxism-Leninism	Marxism-Leninism	Marxism-Leninism	Marxism-Leninism
	Internal Diseases	Internal Diseases	Epidemiology	Internal Diseases
	Surgical Diseases	Surgical Diseases	Nutrition	Therapeutic Stomatology
	Obstetrics and Gynecology	Pediatrics and Infectious Diseases	Labor Hygiene	Orthopedic Stomatology
	Hygiene and Public Health Organization	Hygiene and Public Health Organization	Community Hygiene	Surgical Stomatology

technical rather than a professional practitioner in the Soviet Union) to study stomatology. The curriculum includes 3 years of correspondence work followed by three semesters of full-time study. Correspondence courses are also offered by faculties of pharmacy.

Examinations

On completion of the curriculum in a medical institute, the student takes State examinations for a diploma. These are scheduled between May 23 and July 1 of the final year. There is a total of five examinations in each of the faculties. The disciplines tested are presented in table 3.

After successful completion of the examinations, the new graduate is certified as a general physician (*vratch*), a physician-pediatrician (*vratch-pediatrik*), a physician-hygienist (*sanitarnyi-vratch*) or a physician-stomatologist (*vratch-stomatolog*).

V. POSTGRADUATE TRAINING

After graduation from a medical institute and successful completion of the State examinations, the physician is assigned to work for 3 years, under supervision, as a member of a team of professional personnel responsible for the provision of health services. These 3-year assignments are usually in hospitals and polyclinics in rural or other peripheral areas of the Soviet Union. In this way, the USSR Ministry of Health attempts to effect an adequate distribution of health services throughout the nation.

These assignments are decided by a commission after evaluating the student's clinical performance during the fourth, fifth, and sixth years of the medical curriculum, ascertaining the new graduate's preferences, and considering other variables; e.g., family responsibilities and personal health status. As part of the courses in Marxism-Leninism, the students are reminded of their responsibilities to the State. The 3 years of service is portrayed as the student's opportunity to repay his society for his medical education. Physicians assigned to serve in the more unpopular areas where they must cope with extra hardships receive special allowances and bonuses in addition to their basic salaries.

In one institute visited by the Delegation, the rector publishes the list of vacancies that he has received as his quota. The sixth-year students are given 1 month to indicate their preferences. The rector then tries to trade vacancies listed in his quota with those held by other rectors, in an attempt to meet the needs of the State and the desires of the individual student.

Several of the Soviet medical educators informed the Delegation that more men were needed in medicine because of the difficulties in assigning women physicians to the more isolated and hazardous areas of the country.

Specialization

Training in the clinical specialties is a postgraduate activity that usually begins after the physician has completed the 3 years of mandatory service. Postgraduate training is the responsibility of the 13 institutes for the advanced training of physicians. In addition, there are faculties for the advanced training of physicians in the medical institutes in Donets, L'vov, and Riga. They have their own faculties, research laboratories, and clinical facilities. In several situations the advanced institutes use the wards and outpatient clinics in the same hospitals used by the medical institutes.

Catalogues listing the various courses offered are distributed up to a year in advance of the starting date. A physician can apply for specialist training in a specific institute after requesting the endorsement of his chief. In situations where a polyclinic or hospital is in need of certain specialist services, one of the young physicians may be encouraged and recommended by the chief of service to pursue specific specialty training.

The usual program of specialization entails theoretical and practical work for approximately 6 months in one of the advanced institutes. This represents the first stage of specialization in the clinical discipline and is followed by a period of 2½ years of work as a junior specialist under the supervision of a preceptor in one of the larger hospitals and polyclinics. The preceptors are usually chiefs of a specialty or subspecialty service in the hospital. At the completion of a total

of 3 years of postgraduate study and practice, the physician is eligible for certification as a specialist; e.g., radiologist, therapist, psychiatrist, or dermatologist. To qualify for specialty certification in some disciplines, the physician is required to return to the advanced institute for additional study after completion of the 2½ years of preceptorship. The educational pathways to medical specialization in the US and USSR are compared in figure 3.

Shorter postgraduate courses of 1½ to 2 months duration are also offered. These provide training in a specific technique or in a subspecialty area. In some circumstances, these shorter courses are combined with 18 months of correspondence work to enable physicians to complete the first stage of specialization while being absented from their regular post for only a few weeks. Frequent consultations between the physicians in the correspondence program and the faculty of the advanced institute are encouraged. Following the initial phase of training, the physician continues his pursuit of certification in a specialty by working for the 2½ years as a junior specialist with an appropriate preceptor.

Of the 13 advanced institutes in the USSR, 12 are administratively responsible to the Republic Ministries of Health. The Central Institute for the Advanced Training of Physicians in Moscow is directly under the USSR Ministry of Health.

Continuation Education

The institutes for advanced training of physicians, with the exception of the Central Institute, are also concerned with continued postgraduate training or "refresher training" of practitioners. This training is offered both through correspondence work and 2-month full-time theoretical and practical courses. Two months of refresher training is recommended every 3 years for physicians who are practicing in rural areas, and every 5 years for physicians who are practicing in urban settings. These courses are designed primarily for physicians who are functioning in a general practice capacity.

There are economic incentives for physicians to take this refresher training. The physician's salary is maintained during his 2 months of study in the institute for advanced training; furthermore, he receives a travel allotment and an additional living allowance while away from home. On successful completion of the refresher course, the physician returns to the practice setting with a 20-percent increase in his salary. At the present time, the institutes for advanced training are not able to handle the volume of applicants; the 3- and 5-year cycles represent a goal.

Advanced Degrees

The advanced degrees of "candidate of medical science" (*kandidat meditsinskikh nauk*) and "doctor of medical science" (*doktor meditsinskikh nauk*) are earned after highly specialized advanced preparation, including the completion of an individual research endeavor, writing a thesis, and subsequently defending it before the academic council of the medical institute. The candidate degree is earned first, followed by the preparation of a more advanced dissertation for the doctor's degree. Only a few institutes have the privilege of awarding these degrees. Each award also is reviewed by the USSR Ministry of Health and the USSR Ministry of Higher and Secondary Specialized Education. These degrees are usually earned only by those physicians who aspire to careers in research or teaching.

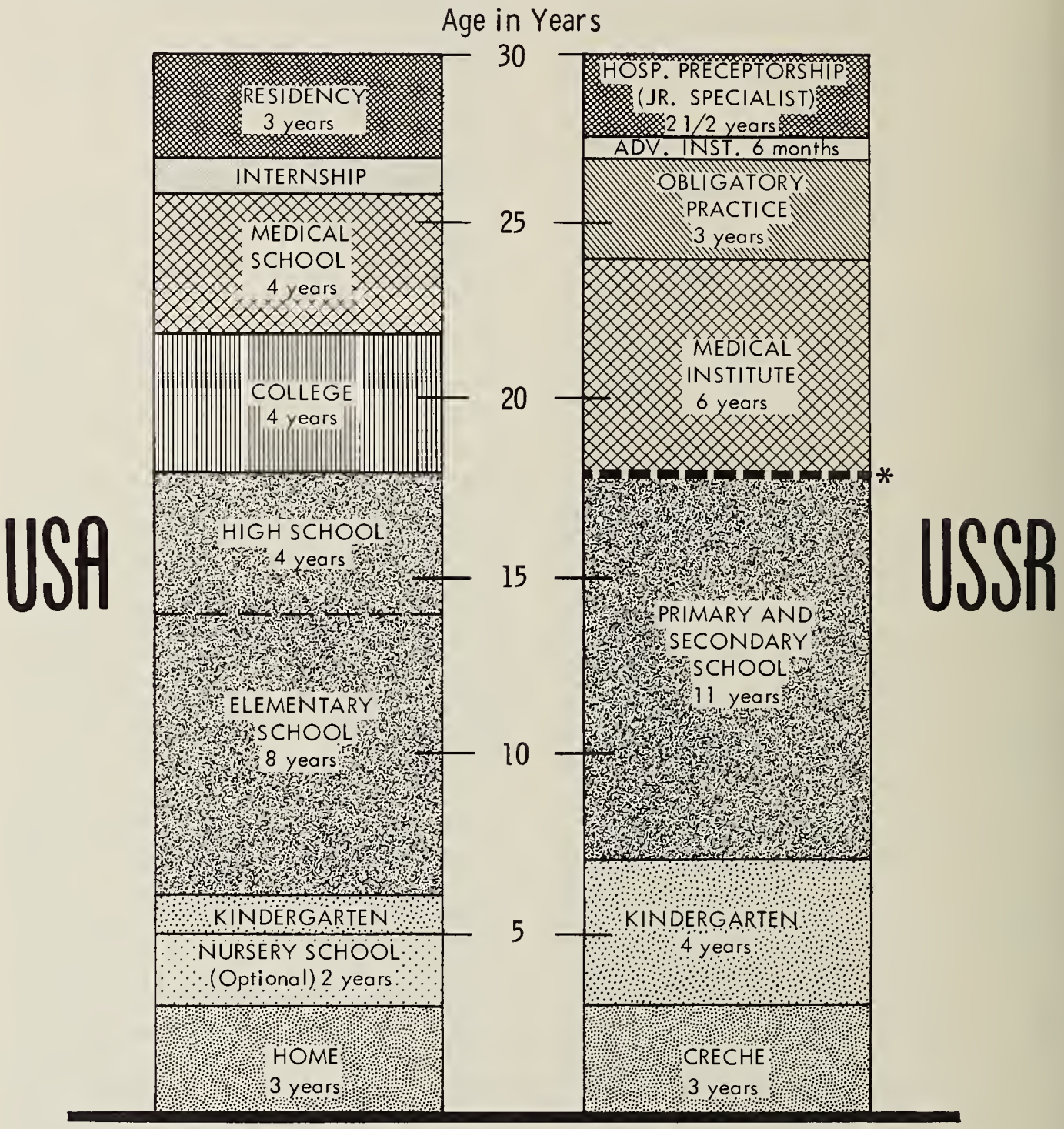
Ordinatura

These positions, not unlike residencies in many teaching hospitals in the United States, provide postgraduate training in a clinical discipline and are usually 2 years in length. The positions are directly under the supervision of a professor in a medical institute, advanced training institute, or research institute. In many cases the clinical training combines responsibilities for patient care with opportunities for the physician to conduct clinical research. Physicians who apply for and are accepted in *ordinatura* will usually enter careers as specialists, chiefs of service in hospitals and polyclinics, or other important clinical posts.

Training as an *ordinator* is usually entered after a physician has completed his 3 years of obligatory service. Students who

Figure 3

PREPARATION OF A MEDICAL SPECIALIST IN U. S. A. AND U. S. S. R., 1963



*Preference is shown applicants with 2 years of work experience when determining admission to medical institute.
Source: Based on data secured by the Delegation during course of mission.

are outstanding during their clinical years of study may be selected to enter *ordinatura* immediately after graduation and in lieu of the 3 years of service. Occasionally a physician may be selected for this training later in his career, on the recommendation of health authorities, should he demonstrate a particular clinical competence.

Completion of clinical research and preparation of a thesis by an *ordinator* can enable him to qualify for the "candidate of medical science" degree. This individual may seek an appointment as an assistant in a clinical chair, after completion of the training regardless of whether or not he has obtained the candidate degree. An *ordinator* can also apply for *aspirantura* should he wish to pursue research training and qualify for candidate and doctor degrees.

Aspirantura

These positions entail research training at the graduate level. The *aspirant* spends 3 years learning the methodologies and techniques of scientific research in a specific basic or clinical discipline and becoming familiar with the literature. Research work is usually conducted in collaboration with a professor or senior research investigator. Occasionally the *aspirant* does independent research. The graduate student in a medical institute assumes certain teaching responsibilities for the laboratory phases of the courses in his discipline during the third and final years of the *aspirantura*. Training as an *aspirant* does not entail clinical work. In some chairs in medical and research institutes, both physicians and university graduates are accepted in the same *aspirantura*. A total of 4,057 *aspirants* were reported to be enrolled for research training in medicine and pharmacy during 1962.[7]

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[7] Annual Economic Indicators for the U.S.S.R., Joint Economic Committee, Congress of the United States. Joint Committee Print, February 1964, p. 85.

VI. RESEARCH IN THE MEDICAL SCIENCES

Scientific research enjoys a very high priority in the Soviet Union. Biological research is conducted in research institutes and universities as well as in medical institutes. There is coordination of research in the biological sciences by the USSR Academy of Sciences and in the medical sciences by the USSR Academy of Medical Sciences. These agencies establish priority needs for research, and direct research into appropriate areas through the allocation of budgets.

Student Scientific Circles

Medical students have an opportunity to become acquainted with research in the medical sciences through "scientific circles." These correspond to a combination of research societies and journal clubs. Most chairs in a medical institute have a scientific circle for students interested in pursuing the specific discipline in greater depth. These circles represent an active and energetic program of organized extracurricular activity directed towards increasing the student's interest in research.

Although students can participate in these circles beginning in the first year, the heavy schedule of required courses causes most students to postpone participation until their third year. Between 20 and 25 percent of medical students participate in the "scientific circles." Conferences and symposia are held by individual medical institutes, the Ministries of Health in the Republics, and by the USSR Ministry of Health, at which students present papers based on their research. Awards are offered for outstanding papers.

One rector of a medical institute estimated that between 1 and 2 percent of the students in the "scientific circles" develop into serious research workers. Some of the students who do outstanding research are given the opportunity to go directly into *aspirantura* in medical institutes or research institutes following graduation. In this situation, they are excused from the obligatory 3 years of service. Bright students who demonstrate promise for future research achievements are encouraged to pursue academic careers.

As noted previously, a faculty appointment as a docent or professor is for a tenure of 5 years. The conduct of research is very important for the individual seeking reappointment or promotion. Election to the prestigious positions of corresponding or full membership in the USSR Academy of Medical Sciences requires a record of significant research achievements.

Research Institutes

There are 27 research institutes of the USSR Academy of Medical Sciences. The majority of these are located in Moscow and Leningrad. Research institutes are also maintained by the USSR Academy of Sciences, the Republic Academies of Sciences, the USSR Ministry of Health, and the Republic Ministries of Health. Efforts are made to coordinate the research activities in all of these institutes in order to minimize duplication and to direct efforts into priority areas.

Central Laboratories

The USSR Ministry of Health has recently approved the planning and construc-

tion of 40 "central laboratories." These will be attached to medical institutes and will be utilized for multidisciplinary clinical research. The organization and function of these laboratories appears to be comparable to those sponsored by the National Institutes of Health under the Clinical Research Centers Program. Several Soviet medical educators informed the Delegation that these laboratories will strengthen the role of scientific research in the teaching programs of the medical institutes.

VII. PARAMEDICAL EDUCATION

In the Soviet Union, the training of "middle level" or "paramedical" personnel—nurses, midwives, feldshers, and technicians—is closely related to the preparation of physicians. The "middle medical schools" are also within the jurisdiction of the USSR Ministry of Health, and the Ministries of Health in the respective republics. There are 560 "middle medical schools" with a total enrollment of approximately 220,000.

Students usually enroll in the "middle medical schools" after the completion of 7 or 8 years of primary and secondary education. In this circumstance, the curriculum has a duration of 2½ years for nurses and 4 years for midwives, feldshers, and certain technicians. The 4-year course of study combines professional training with some of the subjects the student would have studied in grades 9, 10, and 11; e.g., Russian language and literature, history, Marxism-Leninism, and foreign languages. The feldsher and midwife course is only 2½ years in duration for students who have completed the 10 or 11 years of general primary-secondary education.

In addition to the full-time courses of study conducted during the day, most "middle medical schools" also have evening programs, staffed by a separate faculty, for individuals who have completed 7 or 8 grades and wish to pursue paramedical training while working full-time. In these programs, 4 years of evening study are equivalent to 3 years of full-time study. In all circumstances, the clinical phase of training must be undertaken on a full-time basis.

During the clinical phase of training, the student spends approximately 60 percent of the time with theoretical work at the school and 40 percent of the time working under supervision in a facility concerned with the provision of health services.

On graduation, the top 5 percent of the students may take the entrance examination for the medical institutes. If they pass the examinations, they may move directly into higher education. Other graduates who desire to continue medical education may apply, after 2 years of employment, for the programs of evening study in the medical institutes. They may apply for admission to the regular day-study after they have completed 3 years of obligatory service. As noted previously, between 20 and 25 percent of medical students have had previous paramedical training.

The vast majority of the graduates of the "middle medical schools" receive beginning job assignments that, for nurses and feldshers, determine their subsequent line of specialization, if any; e.g., pediatric nursing, operating-room nursing, feldsher-laboratory technicians, and feldsher-anesthetists. Paramedical personnel are encouraged to take 2 to 6 months of refresher and advanced training every 5 years.

Feldshers and midwives are prepared to work primarily as members of the team providing health services under the supervision of a physician. Many of the rural areas in the Soviet Union depend on "feldsher-midwife stations" for their routine medical care. These stations are usually backed up by physician and specialist services on a consulting basis. Patients with complicated diseases can be sent to the closest polyclinic or hospital.

Many "middle medical schools" are now

located apart from hospitals, polyclinics, or comparable facility responsible for the provision of health services. Current planning by the USSR Ministry of Health specifies that the construction of new schools for paramedical training must be related to an existing hospital or be included in the construction plans of a new hospital.

VIII. IMPRESSIONS AND COMMENTS

As is obvious, the Delegation did not attempt a thorough evaluation of medical education in the Soviet Union. Our data are inadequate for such a purpose, even had such an evaluation been intended. Although the Delegation had the opportunity to learn about the plans and objectives of medical education in the Soviet Union as well as the operation of certain programs, an analysis of the relative success or failure in implementation of specific goals was not undertaken.

The Soviet Union has an effective system of medical education. Starting with an inadequate base of medical manpower at the end of the Revolution, sufficient health personnel have been developed to reduce significantly the incidence of communicable disease, infant mortality, and maternal mortality. Furthermore, the system has prepared some physicians and scientists of the highest quality.

The most substantial achievements by the Soviets in medical education and health services have been in the organization and application of existing scientific and medical knowledge through the provision of health services to the population. The integration and coordination of preventive, curative, and restorative health services into a unified plan represent a major strength of their health program. There appears to be greater emphasis in these areas than in scientific investigations directed toward the development of new knowledge.

In the opinion of the Delegation, some of the deficiencies in the scientific components of medicine could be attributed to the separation of undergraduate medical education from both universities and the scientific research institutes. Moreover, there appeared to be a lack of multidisciplinary research laboratories, computer centers, and other facilities which serve the manifold uses of the university or larger scientific community. The development of "central laboratories" for clinical research in medical institutes indicates a trend toward an increase in interdisciplinary activity. If this signifies the initiation of an effort to expand scientific research in the environment of the medical institutes, the Soviet medical student of the future should have a greater exposure to the biological sciences that influence medicine. At present, his exposure to the "art of medicine" appears greater than his exposure to the "science of medicine."

The responsibility of the USSR Ministry of Health for the central direction of medical education was viewed by the Delegation as both a strength and a weakness. The development and promulgation of a unified curriculum tends to graduate a physician who is much like every other physician; therefore, physicians can be interchangeable in the various health and medical programs. The interchangeability of medical manpower can contribute to an effective distribution of health services.

The small degree of variation within and between medical institutes, however, probably discourages and inhibits experimentation in curriculum content, structure, and methodology. The Delegation considers such experimentation to be essential if there is to be effective utilization and incorporation into a medical curriculum of the latest scientific developments as well as improvements in the methods for providing health services. This is considered to be one of the principal values of the elective courses that are a

prominent feature of the curricula of US medical colleges.

The mechanism for revision of the curriculum every 5 years by the USSR Ministry of Health and the USSR Ministry of Higher and Secondary Specialized Education, facilitates the national implementation of new ideas that are recognized as desirable to improve the curriculum. This same mechanism, however, represents a bureaucracy which can serve as a conservative force to obstruct the growth and development of new approaches that merit trial.

Soviet medical education places great emphasis on preventive medicine and promotion of health. An illustration of the relative importance of these areas in the Soviet Union and the United States may be inferred from a comparison of the percentage of physicians entering the field. Whereas 15 percent of the medical students in the USSR study the sanitation-hygiene curriculum, less than 1 percent of medical graduates in the United States pursue postgraduate or residency training in preventive medicine or public health.

The Soviet medical curriculum manifests a concern for the importance of medicine as a social institution. The courses in Marxism-Leninism (history of the Communist Party, political economy, and historical and dialectical materialism) have been interpreted as propagandistic efforts by the State. Nevertheless, these courses consider the social responsibilities of the physician. Such direction is in keeping with the predominantly service role that has been formulated for the Soviet medical practitioner.

Laboratory work of an elementary nature was observed in some of the student laboratories in basic science departments. Laboratory sessions frequently consisted of demonstrations. The physiology, biochemistry, and pharmacology laboratories lacked sophisticated scientific instruments. The "scientific circles" appeared to compensate for the lack of opportunity for individual work in the regular courses by providing a setting in which the interested student could receive supervision and guidance as he undertook increasingly independent research.

There is an extensive schedule of didactic lectures during the clinical years. It appeared that Soviet medical students spend a significant portion of their time in an observational role. Clinical students were encountered by the Delegation in lectures, watching operations, viewing movies on surgical technique, and as observers in a clinic. The paucity of students on the wards or involved directly with patient-care activities in various clinical facilities utilized for the teaching of fourth-, fifth-, and sixth-year medical students was apparent. Ward work appeared to be conducted during a specifically scheduled period of time, and the medical student was not observed as a ubiquitous figure on the ward as is often the situation in the United States. The work day for the Soviet medical student appeared to be much shorter than that of his American counterpart. The Delegation was not able to determine the degree to which medical students assume individual initiative and responsibility for the care and study of specific patients. In this connection, it should be noted that the Delegation did not have the opportunity to observe the summer practice experience scheduled in the curriculum following the third, fourth, and fifth years.

The paucity of cadavers for the study of human anatomy surprised the Delegation. It can be assumed that an abundance of cadavers would be available in a utilitarian society. This factor has been cited as contributing to the pioneering work carried out in the Soviet Union in the use of cadaver blood, organ transplants, and bone, corneal, and vascular grafts. Apparently death benefits, including burial, were one of the early innovations under the Communist Party. This rite could not be afforded previously by most individuals and now appears to be a jealousy guarded prerogative. Soviet medical educators found it difficult to believe that there are few religious beliefs in the United States that prohibit autopsies or the use of the deceased as cadavers. The increasing acceptance in the United States of the practice of individuals willing their bodies for medical purposes seemed incredible to physicians in the USSR.

It appeared that the medical institutes

tended to be "inbred" with little exchange of students and faculty. This is in marked contrast with the pattern of extensive geographic mobility that characterizes academic medicine in the United States. This factor may be less significant in the Soviet Union, since the contribution of cross fertilization to a teaching program is probably not as important where all programs use the same curriculum, as it is for American medical colleges with the variation between individual programs.

Scientific instrumentation and the technology of hospital and laboratory design are limited. The lack of abundance in equipment is understandable in terms of the national economy which has had to develop in many areas, to sustain a major military effort, and to recover from the ravages of World War II. The rather archaic dimensions of the functional design of the facilities cannot be solely attributed to these factors, however. It appears that there has been an unwillingness to study and utilize the recent developments in hospital design that can be observed in numerous countries in the Western world.

Medical libraries were small and inadequate to support extensive scholarship or research based on a utilization of the contributions of the world scientific community. A broader awareness of work being carried out in other laboratories and centers is essential to sustain scientific endeavors that will make significant contributions of new knowledge. It should be noted that some books seen by the Delegation carried extensive references to work done by US investigators.

Some of the clinical research being conducted in the medical institutes was comparable to that being conducted in many university medical centers in the United States, and some was truly remarkable. The sophistication and depth of the research and teaching in the basic sciences, however, in most medical institutes, appeared limited when compared to either that conducted in medical schools in the United States or that seen in the research institutes that constitute the *Science City* in Novosibirsk. The scientific preparation for students in the medical biology program in Novosibirsk University was of greater intensity and depth than that in the medical institutes. This depth of preparation in the sciences appears to be reserved for the few outstanding students who demonstrate exceptional promise during their study in the medical institutes.

The two features of the system of medical education in the Soviet Union that most impressed the Delegation are the opportunities for paramedical personnel to study medicine, and the organized program of continuation education. Both of these activities warrant careful evaluation by American medical educators.

As noted previously, nurses, midwives, and feldshers who accomplish outstanding work during their paramedical education may apply for admission to medical institutes. There is also the opportunity for evening study, should the individual wish to advance from the role of paramedical worker to that of physician. Several leading physicians in the Soviet Union, including a former Minister of Health, have progressed through these programs.

While it is not uncommon for students to switch from M.D. preparation to Ph.D. programs in the basic sciences in the United States, it is highly unusual for an outstanding graduate of a collegiate nursing program to enter medical school. There are indications that it is more common for pharmacy graduates to study medicine, but the data with respect to this subject are limited. In view of the need for more physicians, particularly family practitioners, it would appear to be desirable for educators in the United States to explore the feasibility of modifying the curriculum of undergraduate professional education; e.g., nursing, pharmacy, physical therapy, and occupational therapy, so that premedical requirements would be met, thus enabling the outstanding student, who is so inclined, to progress into medical schools.

The programs in continuation education and refresher training provided by the institutes for advanced training of physicians in the Soviet Union are impressive in concept and goal. The economic incentives for the practicing physician to participate in

these activities are substantial. In view of the recent discussions of *Lifetime Learning for Physicians*,[8] it would seem desirable to seek the opportunity for a close examination of the concept of refresher training for the health professions and its implementation in the Soviet Union.

Finally, the government in the Soviet Union emphasizes the development of a healthy population as a vital national resource. Accordingly, high priority is given to the preparation of sufficient physicians and other health professionals to protect and improve this essential resource. Tuition is not charged in the medical institutes, and over three-quarters of Soviet medical students receive stipends. The economic obstacles to be surmounted by the intelligent student with an interest in a medical career are, therefore, minimized.

[8] Lifetime Learning for Physicians. A Report from the Joint Study Committtee in Continuing Medical Education. Journal of Medical Education, June 1962—Part II.

IX. SUMMARY AND CONCLUSION

The Delegation on Medical Education under the 1962–63 US–USSR Cultural Exchange Agreement spent 3 weeks in October and November 1963 visiting educational and research institutions and meeting health officials, medical educators, and research scientists in the Soviet Union. The itinerary included over 40 institutes, departments, hospitals, universities, and ministries in Moscow, Leningrad, Kiev, Baku, Tashkent, and Novosibirsk.

There is unanimous agreement among the members of the Delegation that exchanges of this type are of significant value in providing the opportunity to learn of varying approaches to comparable problems. The contributions of such missions toward furthering mutual understanding and stimulating international cooperation in health and the medical sciences warrant emphasis.

However, the limitations of such a program must be recognized. The brevity of these exchanges necessitates a superficial examination of a complex activity. Misinterpretations and inaccurate or unsupported conclusions are hazards. Nevertheless, the potential benefits justify the risk.

In conclusion, the Delegation endorses exchanges of this type as a valid basis for substantially expanded and intensified cooperation in the health fields between the United States and the Union of Soviet Socialist Republics. The free exchange of graduate students, professors, research scientists, and other professional health personnel for durations of several months to a few years can be mutually beneficial to both our societies.

Appendix A: Curricula of Medical Institutes*

1. Faculty of Therapy—April 26, 1960†
2. Faculty of Pediatrics—April 26, 1960
3. Faculty of Sanitation-Hygiene—June 23, 1960
4. Faculty of Stomatology—April 26, 1960
5. Faculty of Pharmacy—May 7, 1960
6. Faculty of Therapy (Evening Division)—May 7, 1960
7. Faculty of Stomatology (Evening Division)—May 7, 1960

*Taken from a brochure supplied the Delegation by the USSR Ministry of Health, and identified by the following printer's mark.

Redaktor V.N. Sorokina
Korrektory O.V. Makarova i. L.N. Oganova
Podpisana v. pechat 25 VIII 60 godu
Obyem 6 P.L. Zakaz 645 Tirazh 3000 EKZ
Tipografia (Moskovskaya Pravda)

†The date the curriculum was approved by the USSR Ministry of Health and the USSR Ministry of Higher and Specialized Secondary Education is shown.

LEGEND FOR CHARTS THAT FOLLOW:
*Seminars
★Total Hours of lecture (numerator) and practical work (denominator) are shown.

▲Total figures from original source. Inconsistency in addition not changed.

( ) Parentheses indicate that courses and hours are a part of the numbered course listed immediately above. Example: In the curriculum plan for the Faculty of Therapy, the Faculty Course in Surgery has 98 hours of lecture and 111 hours of practical work; within this course, Urology is taught during 12 hours of lecture and 18 hours of practical work during the 8th term.

NOTE: The curricula plans specify the number of hours of lecture (numerator) and practical or laboratory work (denominator) scheduled for each week during a term. Example: In the curriculum plan for the Faculty of Therapy, psychiatry is taught during the 1st term of the 5th year. The plan shows 2/3 for the 9th term—2 hours of lecture and 3 hours of practical work for each of the 18 weeks—for a total of 90 hours (36 hours of lecture and 54 hours of practical work).

CURRICULUM, FACULTY OF THERAPY

SERIAL NO.	DISCIPLINE	HOURS				FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		SIXTH YEAR		SERIAL NO.
		TOTAL	LECTURE	LABORATORY	PRACTICAL	1st Term 18 weeks	2nd Term 16 weeks	3rd Term 17 weeks	4th Term 16 weeks	5th Term 19 weeks	6th Term 15 weeks	7th Term 18 weeks	8th Term 13 weeks	9th Term 18 weeks	10th Term 16 weeks	11th Term 20 weeks	12th Term 15 weeks	
1	History of Communist Party, USSR	150	80		70*	4	3	5{30hrs 45hrs										1
2	Political Economy	90	46		44*				5{45hrs 36hrs									2
3	Dialectic & Historical Materialism	140	70		70*					2	2	2						3
4	Foreign Language (Latin)	238			238 (86)	0/6 (0/3)	0/4 (0/2)	0/2	0/2									4
5	Physical Culture & Training (Medical Control)	166	16 (16)	16 (16)	134	0/2	0/2	0/2	0/2						1/1 (1/1)			5
6	Physics	152	84	40	28	2/2	3/2											6
7	Biology	172	86	86		3/3	2/2											7
8	Human Anatomy	376	102	274		2/6	2/4	2/6										8
9	Histology & Embryology	182	66	116			2/3	2/4										9
10	a. Inorganic & Analytic Chemistry	140	54	86		3/3	0/2											10
	b. Biological Chemistry	295	131	164			2/2	3/4	3/4									
	(Organic Chemistry)		(32)	(32)			(2/2)											
	(Physical & Colloidal		(17)	(34)				(1/2)										
11	Physiology	246	131	115				3/3	5/4									11
12	Microbiology	207	70	137					2/5	2/3								12
13	Pathological Physiology	155	68	87						2/3	2/2							13
14	Pharmacology	170	68	102						2/3	2/3							14
15	Pathological Anatomy	192	87	105						3/3	2/2							15
	(Dissection)			(18)												(18 hrs)		
16	Introduction to Internal Diseases	274	133	141						4/3	3/4			2				16
	(X-ray Course)		(12)	(24)							(12/24)*							
	(Radiology)		(12)	(24)										(12/24)*				
17	General Surgery	189	87	102						3/3	2/3							17
18	Operative Surgery & Topographical Anatomy	117	33	84							1/2	1/3						18
19	Hygiene	162	81	81							3/3	2/2						19
20	Organization of Public Health	125	51	74								2	1/2	1/2				20
	(History of Medicine)		(20)	(12)								(20/12)*						
21	Faculty Course in Therapy	253	111	142								4/5	3/4					21
	(Tuberculosis)		(12)	(24)								(12/24)*						
	(Physiotherapy)		(8)	(18)									(8/18)*					
22	Faculty Course in Surgery	209	98	111								4/4	2/3					22
	(Urology)		(12)	(18)									(12/18)*					
23	Nervous Diseases	106	44	62									2/2	1/2				23
24	Skin & Venereal Diseases	101	44	57									2/3	1/1				24
25	Obstetrics and Gynecology	379	83	96	200							2/2	1/2	1/1	1/1	200 hrs		25
26	Ear, Nose, & Throat Diseases	88	31	57									1/3	1/1				26
27	Childhood Diseases	166	66	100										1/2	3/4			27
28	Diseases of the Eye	80	32	48											2/3			28
29	Psychiatry	90	36	54										2/3				29
30	Forensic Medicine	100	34	66										1/1	1/3			30
31	Hospital Therapy	486	88	68	350									2/2	2/2	350hrs		31
	(Tuberculosis)				(30)											(30 hrs)		
	(Exercise Therapy)				(8)											(8 hrs)		
32	Infectious Diseases	214	32	32	150										2/2	150 hrs		32
	(Epidemiology)		(18)		(42)													
33	Hospital Surgery	554	102	102	350									3/3	3/3	350 hrs		33
	(Stomatology)		(12)	(24)										(12/24)*				
	(Traumatology & Orthopedics)				(60)											(60 hrs)		
	(Exercise Therapy)				(6)											(8 hrs)		
	TOTAL	6764	2339	2805	1620▽	38	35	36	32	36	36	33	31	34	34	30	30	

CURRICULUM, FACULTY OF PEDIATRICS

SERIAL NO.	DISCIPLINE	HOURS				FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		SIXTH YEAR		SERIAL NO
		TOTAL	LECTURE	LABORATORY	PRACTICAL	1st Term 18 weeks	2nd Term 16 weeks	3rd Term 17 weeks	4th Term 16 weeks	5th Term 19 weeks	6th Term 15 weeks	7th Term 19 weeks	8th Term 13 weeks	9th Term 18 weeks	10th Term 17 weeks	11th Term 19 weeks	12th Term 15 weeks	
1	History of Communist Party, USSR	150	80		70*	4	3	5{30/45										1
2	Political Economy	90	46		44*				5{45/34									2
3	Dialectic & Historical Materialism	140	70		70*					2	2	2						3
4	Foreign Language (Latin)	238 (86)			238 (86)	0/6 (0/3)	0/4 (0/2)	0/2	0/2									4
5	Physical Culture & Training (Medical Control)	168	17 (17)	17 (17)	134	0/2	0/2	0/2	0/2						1/1 (1/1)			5
6	Physics	152	84	40	28	2/2	3/2											6
7	Biology	172	86	86		3/3	2/2											7
8	Human Anatomy	376	102	274		2/6	2/4	2/6										8
9	Histology & Embryology	182	66	116			2/3	2/4										9
10	a. Inorganic & Analytic Chemistry	140	54	86		3/3	0/2											10
	b. Biological Chemistry	295	131	164			2/2	3/4	3/4									
	(Organic Chemistry)		(32)	(32)			(2/2)											
	(Physical & Colloidal)		(17)	(34)				(1/2)										
11	Physiology	246	131	115				3/3	5/4									11
12	Microbiology	207	70	137					2/5	2/3								12
13	Pathological Physiology	155	68	87						2/3	2/2							13
14	Pharmacology	174	68	106						2/4	2/2							14
15	Pathological Anatomy	188	83	105						2/3	3/2			0/1				15
	(Dissection)			(18)										(0/1)				
16	Introduction to Internal Diseases	229	99	130						3/4	2/2			2				16
	(X-ray Course)		(12)	(24)						(12/24)*								
	(Radiology)		(12)	(24)										(12/24)*				
17	General Surgery	189	87	102						3/3	2/3							17
18	Operative Surgery & Topographical Anatomy	102	34	68							1/2	1/2						18
19	Hygiene	185	83	102							3/3	2/3						19
	(Hygiene of Children & Adolescents)		(20)	(40)														
20	Introduction to Diseases of Childhood	121	53	68							1/2	2/2						20
21	Organization of Public Health	124	64	30	30								2/2	2/2				21
	(Infant and Maternal Welfare)		(18)	(18)										(1/1)				
	(History of Medicine)		(20)	(16)										(20/16)*				
22	Faculty Course in Therapy	179	83	96								3/3	2/3					22
	(Tuberculosis)		(19)	(19)								(1/1)						
	(Physiotherapy)		(8)	(18)									(8/18)*					
23	Faculty Course in Surgery & Urology	167	58	109								1/3	3/4					23
24	Skin & Venereal Diseases	96	32	64								1/2	1/2					24
25	Nervous Diseases	102	51	51								2/2	1/1					25
26	Faculty Course of Pediatrics	191	80	111									2/3	3/4				26
27	Infectious Diseases	140	70	70										2/2	2/2			27
	(Epidemiology)		(12)	(24)														
28	Obstetrics & Gynecology	211	81	130								1/1	2/3	2/4				28
29	Infectious Diseases of Childhood	332	91	91	150										2/2	3/3	150hrs	29
	(Epidemiology)		(12)	(24)														
30	Ear, Nose, & Throat Diseases	95	38	57												2/3		30
31	Diseases of the Eye	85	34	51											2/3			31
32	Hospital Therapy	140	70	70										2/2	2/2			32
33	Hospital Pediatrics	464	91	148	225										2/2	3/6	225hrs	33
	(Tuberculosis)			(30)													(30)	
	(Exercise Therapy)			(8)													(8)	
34	Hospital Surgery	210	105	105										3/3	3/3			34
	(Stomatology)		(10)	(24)											(10/24)*			
	(Exercise Therapy)			(8)											(0/8)			
35	Pediatric Surgery & Orthopedics	170	38	57	75											2/3	75hrs	35
36	Psychiatry	95	38	57												2/3		36
37	Forensic Medicine	85	34	51											2/3			37
	TOTAL	6785	2584	3151	1050▽	36	35	36	32	36	36	33	31	34	34	30	30	

CURRICULUM, FACULTY OF SANITATION-HYGIENE

SERIAL NO	DISCIPLINE	HOURS				FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		SIXTH YEAR		SERIAL NO.
		TOTAL	LECTURE	LABORATORY	PRACTICAL	1st Term 18 weeks	2nd Term 17 weeks	3rd Term 17 weeks	4th Term 17 weeks	5th Term 19 weeks	6th Term 13 weeks	7th Term 18 weeks	8th Term 13 weeks	9th Term 19 weeks	10th Term 16 weeks	11th Term 18 weeks	12th Term 15 weeks	
1	History of Communist Party, USSR	150	80		70*	4	3	5{30/44										1
2	Political Economy	90	46		44*				5{46/40									2
3	Dialectic & Historic Materialism	140	70		70*					2	2	2						3
4	Foreign Language (Latin)	244			244 (88)	0/8 (0/3)	0/4 (0/2)	0/2	0/2									4
5	Physical Culture (Medical Control)	174	18 (18)	18 (18)	138	0/2	0/2	0/2	0/2							1/1 (1/1)		5
6	Physics	176	88	50	38	3/3	2/2											6
7	Biology	176	88	88		3/3	2/2											7
8	Human Anatomy with Topographical Anatomy	295	104	191		2/4	2/4	2/3										8
9	Histology & Embryology	153	68	85			2/2	2/3										9
10	Inorganic Chemistry (Analytical) (Physical & Colloidal)	227	53 (17)	174 (51) (51)		2/4	0/3 (0/3)	1/3 (1/3)										10
11	Biological Chemistry (Organic Chemistry)	272	102 (34)	170 (51)			2/3 (2/3)	2/4	2/3									11
12	Physiology	255	119	136				3/4	4/4									12
13	Microbiology & Virology	248	89	159					3/6	2/3								13
14	Pathological Physiology	160	64	96						2/3	2/3							14
15	Pharmacology with General Toxicology	141	64	77						2/2	2/3							15
16	Pathological Anatomy	154	77	77						2/2	3/3							16
17	Introduction to Internal Diseases (Radiology)	225	103 (13)	122 (13)						2/3	5/5 (1/1)							17
18	General Surgery	185	70	115						3/4	1/3							18
19	General Hygiene (Radiation Hygiene	235	117 (18)	118 (36)					1/0	2/2	2/2	1/1				1/2 (1/2)		19
20	Internal Disease (Tuberculosis)	191	80 (18)	111 (18)								3/4 (1/1)	2/3					20
21	Occupational Diseases	64	32	32											2/2			21
22	Surgical Diseases & Traumatology (Organization of Traumatological Aid)	194	81 (19)	113 (38)								2/2	2/3	1/2 (1/2)				22
23	Skin & Venereal Diseases	72	36	36								2/2						23
24	Nervous Diseases	80	32	48											2/3			24
25	Organization of Public Health (Sanitary Statistics) (History of Medicine)	244	105 (19) (20)	42 (19) (12)	97									1/1 (1/1)	2/3 (20/12)*	3/4		25
26	Obstetrics & Gynecology	111	49	62								2/2	1/2					26
27	Infectious Diseases	167	77	90									3/4	2/2				27
28	Hygiene of Nutrition	263	80	93	90							3/3	2/3				90hrs	28
29	Communal Hygiene	333	83	160	90								2/5	3/5			90hrs	29
30	Childhood Diseases Inc. Infectious	140	70	70										2/2	2/2			30
31	Ear, Nose, & Throat Diseases	72	36	36								2/2						31
32	Psychiatry	48	16	32											1/2			32
33	Diseases of the Eye	57	19	38										1/2				33
34	Legal Medicine	72	36	38												2/2		34
35	Epidemiology & Disinfection (Parasitology) (Indication of Pathogenic Microbes)	392	124 (18)	178 (18) (36)	90									2/2	2/2	3/6 (1/1) (0/2)	90hrs	35
36	Labor Hygiene	357	106	161	90									2/3	2/2	2/4	90hrs	36
37	Hygiene of Children & Adolescents	244	68	86	90										2/2	2/3	90hrs	37
	TOTAL	6804	2587	3550	687▽	38	35	38	32	36	38	33	32	33	33	36	30	

CURRICULUM, FACULTY OF STOMATOLOGY

SERIAL NO	DISCIPLINE	HOURS				FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		SERIAL NO.
		TOTAL	LECTURE	LABORATORY	PRACTICAL	1st Term 18 weeks	2nd Term 16 weeks	3rd Term 17 weeks	4th Term 16 weeks	5th Term 19 weeks	6th Term 16 weeks	7th Term 18 weeks	8th Term 14 weeks	9th Term 18 weeks	10th Term 10 weeks	
1	History of Communist Party, USSR	150	80		70*	4	3	5{30								1
2	Political Economy	90	46		44*			45	5{45							2
3	Dialectic & Historic Materialism	140	70		70*				34	2	2	2				3
4	Foreign Language (Latin)	238			238 (86)	0/6 (0/3)	0/4 (0/2)	0/2	0/2							4
5	Physical Training (Physical Culture)	170	12 (12)	24 (24)	134	0/2	0/2	0/2	0/2					2 (12/24)*		5
6	Physics	152	84	40	28	2/2	3/2									6
7	Biology	172	86	86		3/3	2/2									7
8	Human Anatomy	359	102	257		2/6	2/4	2/5								8
9	Histology & Embryology	182	66	116			2/3	2/4								9
10	a. Inorganic-Analytical Chemistry	140	54	86		3/3	0/2									10
	b. Biological-Organic Chemistry	228	98	132			2/2	2/2	2/4							
	c. Physical-Colloidal Chemistry	51	17	34				1/2								
11	Physiology	247	115	132				3/4	4/4							11
12	Microbiology	191	70	121					2/2	2/3						12
13	Operative Surgery with Topographical Anatomy	64	16	48					1/3							13
14	Pathologic Physiology	140	70	70						2/2	2/2					14
15	Pharmacology	121	51	70						1/2	2/2					15
16	Pathologic Anatomy (Dissection)	158	70	88 (18)						2/2	2/2			0/1 (0/1)		16
17	Introduction to Internal Diseases	211	88	123						2/3	2/3	2				17
	(Roentgenology)		(12)	(24)							(12/24)*					
	(Radiology)		(12)	(24)								(12/24)*				
18	General Surgery	140	35	105						1/3	1/3					18
19	Therapeutic Stomatology	365	105	260						1/2	1/2	1/3	1/3	1/3	2/4	19
20	Orthopedic Stomatology	341	95	246						1/2	1/2	1/3	1/2	1/3	1/4	20
21	Surgical Stomatology	298	86	212							1/2	1/3	1/3	1/3	2/3	21
22	Hygiene	174	70	70	34						1/2	3/4				22
	(Public Health Organization)		(18)	(36)								(18/36)*				
23	Internal Diseases	252	102	150								2/2	2/2	1/2	2/5	23
	(Physiotherapy)		(12)	(18)								(12/18)*				
24	Surgical Diseases	200	68	132								2/3	1/3	1/2		24
25	Nervous Diseases & Psychiatry	96	32	64									1/2	1/2		25
26	Skin & Venereal Diseases	70	28	42									2/3			26
27	Obstetrics	56	14	42									1/3			27
28	Childhood Diseases	54	18	36										1/2		28
29	Ear, Nose & Throat Diseases	74	28	46										1/2	1/1	29
30	Eye Diseases	50	20	30											2/3	30
	TOTAL	5374	1910	2860	604▽	36	35	36	33	33	35	32	31	30	30	

CURRICULUM, FACULTY OF PHARMACY

SERIAL NO.	DISCIPLINE	HOURS				FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		SERIAL NO.
		TOTAL	LECTURE	LABORATORY	PRACTICAL	1st Term 18 weeks	2nd Term 16 weeks	3rd Term 18 weeks	4th Term 16 weeks	5th Term 18 weeks	6th Term 14 weeks	7th Term 18 weeks	8th Term 11 weeks	9th Term 14 weeks	10th Term 14 weeks	
1	History of Communist Party, USSR	150	80		70*	4	3	5{30hrs 46hrs	3{44hrs							1
2	Political Economy	90	50		40*											2
3	Dialectical & Historical Materialism	140	80		60*					3	2	2	2			3
4	Physical Culture	136			136	0/2	0/2	0/2	0/2							4
5	a. Foreign Language	154			154	0/3	0/2	0/2	0/2							5
	b. Latin	120			120	0/4	0/3									
6	Elements of Higher Mathematics	108	54		54	3/3										6
7	Physics	202	84	94	24		3/4	2/3								7
8	Botany	190	86	104		3/4	2/2									8
9	Inorganic Chemistry	220	102	118		3/3	3/4									9
10	Human Anatomy & Physiology	168	84	84		2/2	3/3									10
11	Analytic Chemistry	324	68	256				2/8	2/7							11
12	Organic Chemistry	270	120	150				4/3	3/6							12
13	Physical & Colloidal Chemistry	168	84	84					3/3	2/2						13
14	Biological Chemistry	126	54	72						3/4						14
15	Microbiology	136	68	68				2/2	2/2							15
16	Hygiene	114	64	50						2/2	2/1					16
17	Medical Commodities Science	96	18	78						1/2	0/3					17
18	Pharmacognosy	288	114	174						3/3	3/6	1/2				18
19	a. Technology of Drugs	274	82	192						1/0	2/6	2/6				19
	b. Technology of Galenicals	229	79	150								1/0	3/6	2/6		
20	Pharmaceutical Chemistry	449	171	278							3/4	3/6	3/4	3/5		20
21	Pharmacology & Primciples of Pathophysiology	178	75	103									3/3	3/5		21
22	Forensic Chemistry	108	36	72								2/4				22
23	Organization of Pharmaceutical Operations	224	104	100								3/0	2/4	2/4	20hrs	23
	TOTAL	4662	1757	2227	658	36	34	35	35	28	32	32	30	30		

FIELD EXPERIENCE

CURRICULUM, FACULTY OF THERAPY (Evening Program)

SERIAL NO.	DISCIPLINE	HOURS				FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		SIXTH YEAR		SEVENTH YEAR		SERIAL NO.
		TOTAL	LECTURE	LABORATORY	PRACTICAL	1st Term 18 weeks	2nd Term 18 weeks	3rd Term 18 weeks	4th Term 18 weeks	5th Term 18 weeks	6th Term 18 weeks	7th Term 19 weeks	8th Term 15 weeks	9th Term 18 weeks	10th Term 13 weeks	11th Term 18 weeks	12th Term 16 weeks	13th Term 20 weeks	14th Term weeks	
1	History of Communist Party, USSR	126	86		40*	2	2	3												1
2	Political Economy	54	34		20*				3											2
3	Dialectic & Historic Materialism	90	60		30*					1	2	2								3
4	Foreign Language	198			198	0/3	0/2	0/2	0/2	0/2										4
	(Latin)				(54)	(0/3)														
5	Physics	144	72	60	12	2/2	2/2													5
6	Biology	126	54	72			1/2	2/2												6
7	Human Anatomy	252	72	180		1/2	1/2	1/2	1/4											7
8	Histoloby & Embryology	144	72	72					2/2	2/2										8
9	a. Inorganic & Analytical Chemistry	108	36	72		2/2	0/2													9
	b. Organic Chemistry	72	36	36				2/2												
	c. Physical & Colloidal Chemistry	36	18	18					1/1											
	d. Biological Chemistry	144	36	108						1/3	1/3									
10	Physiology	198	90	108						2/3	3/3									10
11	Microbiology	167	74	93								2/3								11
12	Pathological Physiology	155	68	87							2/2	2/3	2/2							12
13	Pharmacology	170	68	102								2/3	2/3							13
14	Pathological Anatomy	192	87	105								3/3	2/2			0/1				14
	(Dissection)			(18)												(0/1)				
15	Introduction to Internal Diseases	255	99	156								3/3	2/5			2				15
	(X-ray)		(12)	(24)								(12/24)*								
	(Radiology)		(12)	(24)												(12/24)*				
16	General Surgery	170	68	102								2/3	2/3							16
17	Operative Surgery & Topographical Anatomy	117	33	84									1/2	1/3						17
18	Hygiene	162	81	81									3/3	2/2						18
19	Organization of Public Health	129	49	80										1/1	1/2	1/2				19
	(History of Medicine)		(12)	(24)										(12/24)*						
20	Faculty Course in Therapy	266	111	155										4/5	3/5					20
	(Tuberculosis)		(12)	(24)										(12/24)*						
	(Physiotherapy)		(8)	(18)											(8/18)*					
21	Faculty Course in Surgery	227	98	129										4/5	2/3					21
	(Urology)		(12)	(24)										(12/24)*						
22	Nervous Diseases	93	31	62											1/2	1/2				22
23	Skin & Venereal Diseases	93	31	62											1/2	1/2				23
24	Obstetrics & Gynecology	226	96	130										2/2	2/2	1/2	1/2			24
25	Ear, Nose, & Throat Diseases	78	26	52											2/4					25
26	Childhood Diseases	152	68	84												2/2	2/3			26
27	Eye Diseases	64	32	32													2/2			27
28	Psychiatry	100	40	60														2/3		28
29	Forensic Medicine	100	40	60														2/3		29
30	Hospital Therapy	404	164	240												2/2	3/4	4/7		30
	(Physical Culture & Medical Control)		(20)	(20)														(1/1)		
31	Infectious Diseases & Epidemiology	152	68	84												2/2	2/3			31
32	Hospital Surgery	434	182	252												3/4	3/5	4/5		32
	(Stomatology)		(12)	(24)												(12/24)*				
	(Traumatology with Orthopedics)		(20)	(40)														(20/40)*		
	TOTAL	5598	2270	3028	300	16	16	16	16	16	16	34	34	32	32	34	32	30		

CURRICULUM, FACULTY OF STOMATOLOGY (Evening Program)

SERIAL NO	DISCIPLINE	HOURS				FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		SIXTH YEAR		SERIAL NO.
		TOTAL	LECTURE	LABORATORY	PRACTICAL	1st Term 18 weeks	2nd Term 18 weeks	3rd Term 18 weeks	4th Term 18 weeks	5th Term 18 weeks	6th Term 18 weeks	7th Term 19 weeks	8th Term 16 weeks	9th Term 18 weeks	10th Term 14 weeks	11th Term 18 weeks	12th Term 10 weeks	
1	History of Communist Party, USSR	126	86		40*	2	2	3										1
2	Political Economy	54	34		20*				3									2
3	Dialectic & Historic Materialism	90	60		30*					1	2	2						3
4	Foreign Language (Latin)	198			198 (54)	0/2 (0/2)	0/3 (0/1)	0/2	0/2	0/2								4
5	Physics	144	72	60	12	2/2	2/2											5
6	Biology	126	54	72		1/1	1/1	1/2										6
7	Human Anatomy	234	72	162		1/2	1/2	1/2	1/3									7
8	Histology & Embryology	144	72	72					2/2	2/2								8
9	a. Inorganic & Analytical Chemistry																	9
	b. Biological, Organic, Physical & Colloidal	342	126	216		1/2	1/1	2/3	1/2	1/2	1/2							
10	Physiology	198	90	108						3/3	2/3							10
11	Microbiology	149	74	75							2/1	2/3						11
12	Operative Surgery & Topographical Anatomy	54	18	36							1/2							12
13	Phathological Physiology	140	70	70								2/2	2/2					13
14	Pharmacology	124	54	70								2/2	1/2					14
15	Pathological Anatomy (Dissection)	158	70	88 (18)								2/2	2/2			0/1 (0/1)		15
16	Introduction in Internal Diseases	211	82	129								2/3	2/3	2				16
	(Roentgenology)		(12)	(24)									(12/24)*	(12/24)*				
	(Radiology)		(12)	(24)														
17	General Surgery	140	35	105								1/3	1/3					17
18	Therapeutic Stomatology	365	105	260								1/2	1/2	1/3	1/3	1/3	2/4	18
19	Orthopedic Stomatology	355	95	260								1/2	1/2	1/3	1/3	1/3	1/4	19
20	Surgical Stomatology	298	86	212									1/2	1/3	1/3	1/3	2/3	20
21	Hygiene	174	70	70	34								1/2	3/4				21
	(Public Health Organization)		(18)	(36)										(1/2)				
22	Internal Diseases	288	120	168										2/2	2/2	2/3	2/5	22
	(Physiotherapy)		(12)	(18)										(12/18)*				
	(Physical Culture & Medical Supervision)		(18)	(18)												(1/1)		
23	Surgical Diseases	200	68	132										2/3	1/3	1/2		23
24	Nervous Diseases & Psychiatry	96	32	64											1/2	1/2		24
25	Skin & Venereal Diseases	70	28	42											2/3			25
26	Obstetrics	56	14	42											1/3			26
27	Childhood Diseases	54	18	36												1/2		27
28	Ear, Nose, & Throat Diseases	74	28	46												1/2	1/1	28
29	Eye Diseases	50	20	30													2/3	29
	TOTAL	4714	1761	2619	334	16	16	16	16	16	16	34	32	30	32	30	30	

Appendix B: Institutions Conducting Medical Education

Medical Institutes

1. Aktiubinsk State Medical Institute
   Lenina ul., 78
   Aktiubinsk, Kazakh SSR
   Faculty: Therapy
   Evening: Therapy
   Correspondence: None

2. Alma-Ata State Medical Institute
   Komsomol'skaia ul., 96
   Alma Ata, Kazakh SSR
   Faculties: Therapy, Pediatrics, Stomatology, Pharmacy
   Evening: Therapy
   Correspondence: Stomatology, Pharmacy

3. Altai Medical Institute
   Lenina prosp., 40
   Barnaul, RSFSR
   Faculty: Therapy
   Evening: Therapy
   Correspondence: None

4. Andizhan Medical Institute
   Dom Sovetov
   Andizhan, Uzbekistan SSR
   Faculty: Therapy
   Evening: Therapy
   Correspondence: None

5. Archangel Medical Institute
   Vinogradova prosp., 51
   Archangel, RSFSR
   Faculties: Therapy, Stomatology
   Evening: None
   Correspondence: None

6. Astrakhan Medical Institute im. A. V. Lunacharskii
   Mechnikova ul., 20
   Astrakhan, RSFSR
   Faculty: Therapy
   Evening: Therapy
   Correspondence: None

7. Azerbaidzhan State Medical Institute im. N. Narimanov
   Karganova ul., 13
   Baku, Azerbaidzhan SSR
   Faculties: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology, Pharmacy
   Evening: None
   Correspondence: Pharmacy

8. Bashkir State Medical Institute
   Frunze ul., 47
   Ufa, RSFSR
   Faculties: Therapy, Pediatrics
   Evening: Therapy
   Correspondence: None

9. Blagoveshchensk Medical Institute
   Gor'kogo ul., 95
   Blagoveshchensk-on-the-Amur, RSFSR
   Faculty: Therapy
   Evening: Therapy
   Correspondence: None

10. Cheliabinsk State Medical Institute
    Kommuny ul., 35
    Cheliabinsk, RSFSR
    Faculty: Therapy
    Evening: None
    Correspondence: None

11. Chernovtsy Medical Institute
    Teatral'naia pl., 2
    Chernovtsy, Ukrainian SSR
    Faculty: Therapy
    Evening: Therapy
    Correspondence: None

12. Chita State Medical Institute
    Profsoiuznaia ul., 39a
    Chita, RSFSR
    Faculties: Therapy, Stomatology
    Evening: None
    Correspondence: None

13. Crimean State Medical Institute
    Lenina b–r, 5/7
    Simferopol, Ukrainian SSR
    Faculties: Therapy, Pediatrics
    Evening: Therapy
    Correspondence: None

Source: Spravochnik dlia postupaiushchikh v. vysshie uchebnye zavedeniia SSSR v 1963g (Handbook for Those Enrolling in Higher Educational Institutions of the USSR in 1963).

14. Dagestan Medical Institute
Lenina pl.
Makhachkala, RSFSR

Faculty: Therapy
Evening: None
Correspondence: None

15. Dnepropetrovsk State Medical Institute
Dzerzhinskogo ul., 9
Dnepropetrovsk, Ukrainian SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene
Evening: Therapy
Correspondence: None

16. Donets Medical Institute im. A. M. Gorkii
Makeevskoe shosse
Donets, Ukraninian SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene
Evening: Therapy
Correspondence: None

17. Erevan Medical Institute
Kirova ul., 2
Erevan, Armenian SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology, Pharmacy
Evening: None
Correspondencc: None

18. Gor'kii Medical Institute im. S. M. Kirov
Minina ul., 10/1
Gor'kii RSFSR

Faculties: Therapy, Pediatrics
Evening: Therapy, Pediatrics
Correspondence: None

19. Grodno State Medical Institute
Ozheshko ul., 1
Grodno, Belorussian SSR

Faculty: Therapy
Evening: None
Correspondence: None

20. Iaroslavl Medical Institute
Revoliutsionnaia ul., 5
Iaroslavl, RSFSR

Faculty: Therapy
Evcning: Therapy
Correspondence: None

21. Irkutsk State Medical Institute
Krasnogo vosstaniia ul., 1
Irkutsk, RSFSR

Faculties: Therapy, Sanitation-Hygiene, Stomatology, Pharmacy
Evening: Therapy
Correspondence: Stomatology

22. Ivan Franko Medical Institute
Maia 1 ul., 7
Ivano-Frankovsk, Ukrainian SSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

23. Ivanovo State Medical Institute
F. Engel'sa ul., 8
Ivanovo, RSFSR

Faculties: Therapy, Pediatrics
Evening: Therapy, Pediatrics
Correspondence: None

24. Izhevsk State Medical Institute
Revoliutsionnaia ul., 199
Izhevsk, RSFSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

25. Kalinin State Medical Institute
Sovetskaia ul., 4
Kalinin, RSFSR

Faculties: Therapy, Stomatology
Evening: None
Correspondence: None

26. Karaganda Medical Institute
Kirova ul., 18
Karaganda, Kazakh SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene
Evening: Therapy
Correspondence: None

27. Kaunas State Medical Institute
Mitskiavichaus ul., 9
Kaunas, Lithuanian SSR

Faculties: Therapy, Stomatology, Pharmacy
Evening: Therapy, Stomatology
Correspondence: Pharmacy

28. Kazan State Medical Institute
Butlerova ul., 49
Kazan, RSFSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology
Evening: Therapy, Sanitation-Hygiene
Correspondence: Stomatology

29. Kemerovo State Medical Institute
Volgogradskaia ul., 1a
Kemerovo oblastnoi, RSFSR

Faculties: Therapy, Stomatology
Evening: Therapy
Correspondence: None

30. Khabarovsk State Medical Institute
Karla Marksa ul., 32
Khabarovsk, RSFSR

Faculties: Therapy, Pediatrics
Evening: None
Correspondence: None

31. Khar'kov Medical Institute
Lenina prosp., 4
Khar'kov, Ukrainian SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene
Evening: Therapy
Correspondence: None

32. Kiev Medical Institute
Tarasa Shevchenko b–r, 13
Kiev, Ukrainian SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology
Evening: Therapy
Correspondence: Stomatology

33. Kirgiz State Medical Institute
Togoloka Moldo ul., 1
Frunze, Kirgiz SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology
Evening: None
Correspondence: None

34. Kishinev State Medical Institute
Lenina prosp., 165
Kishinev, Moldavian SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology
Evening: None
Correspondence: None

35. Krasnoiarsk State Medical Institute
Karla Marksa ul., 124
Krasnoiarsk, RSFSR

Faculties: Therapy, Pediatrics
Evening: Therapy, Pediatrics
Correspondence: None

36. Kuban State Medical Institute
Sedina ul., 4
Krasnodar, RSFSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

37. Kuibyshev State Medical Institute
Chapaevskaia ul., 89
Kuibyshev oblastnoi, RSFSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

38. Kursk State Medical Institute
Karla Marksa ul., 3
Kursk, RSFSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

39. First Leningrad Medical Institute
L'va Tolstogo ul., 6/8
Leningrad, RSFSR

Faculties: Therapy, Stomatology
Evening: Therapy, Stomatology
Correspondence: Stomatology

40. Leningrad Sanitation-Hygiene Medical Institute
Kurakina ul., 1/3
Leningrad, RSFSR

Faculty: Sanitation-Hygiene
Evening: None
Correspondence: None

41. Leningrad Medical Pediatrics Institute
Litovskaia ul., 2
Leningrad, RSFSR

Faculty: Pediatrics
Evening: Pediatrics
Correspondence: None

42. Lugansk State Medical Institute
Oboronnaia ul., 1
Lugansk, Ukrainian SSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

43. L'vov Medical Institute
Pekarskaia ul., 71
L'vov, Ukrainian SSR

Faculties: Therapy, Pediatrics, Stomatology, Pharmacy
Evening: Therapy
Correspondence: Pharmacy

44. Minsk State Medical Institute
Leninskii prosp., 6
Minsk, Belorussian SSR

Faculties: Therapy, Stomatology
Evening: None
Correspondence: Stomatology

45. First Moscow Medical Institute im. I. M. Sechenov
(Order of Lenin)
B. Pirogovskaia ul., 2/6
Moscow, RSFSR

Faculties: Therapy, Sanitation-Hygiene, Pharmacy
Evening: Therapy, Pharmacy
Correspondence: Pharmacy

46. Second Moscow State Medical Institute im. N. I. Pirogov
M. Pirogovskaia ul., 1
Moscow, RSFSR

Faculties: Therapy, Pediatrics
Evening: Therapy
Correspondence: None

47. Novosibirsk State Medical Institute
Krasnyi prospekt, 58
Novosibirsk, RSFSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

48. Odessa State Medical Institute im. N. I. Pirogov
Meditsinskii per., 2
Odessa, Ukrainian SSR

Faculties: Therapy, Pediatrics, Stomatology
Evening: Therapy
Correspondence: None

49. Omsk State Medical Institute im. M. I. Kalinin
Lenina ul., 9
Omsk, RSFSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology
Evening: None
Correspondence: Stomatology

50. Orenburg State Medical Institute
Sovetskaia ul., 6
Orenburg, RSFSR

Faculty: Therapy
Evening: None
Correspondence: None

51. Perm State Medical Institute
Kommunisticheskaia ul., 26
Perm, RSFSR

Faculties: Therapy, Sanitation-Hygiene, Stomatology
Evening: None
Correspondence: None

52. Piazan Medical Institute im. I. P. Pavlov
Maiakovskogo ul., 63
Piazan, RSFSR

Faculties: Therapy, Sanitation-Hygiene
Evening: Therapy
Correspondence: None

53. Riga Medical Institute
Padom'iu b–r, 12
Riga, Latvian SSR

Faculties: Therapy, Stomatology, Pharmacy
Evening: None
Correspondence: Pharmacy

54. Rostov State Medical Institute
Nakhichevanskii per., 29a
Rostov-on-the-Don, RSFSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene
Evening: Therapy
Correspondence: None

55. Samarkand State Medical Institute im. I. P. Pavlov
Kommunisticheskaia ul., 35
Samarkand, Uzbekistan SSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

56. Saratov State Medical Institute
VLKSM letiia 20 ul., 112
Saratov, RSFSR

Faculties: Therapy, Pediatrics
Evening: Therapy, Pediatrics
Correspondence: None

57. Semipalatinsk State Medical Institute
Semipalatinsk, Kazakh SSR

Faculties: Therapy, Pediatrics
Evening: Therapy
Correspondence: None

58. Severo-Ossetian Medical Institute
Pushkinskaia ul., 40
Ordzhonikidze, RSFSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

59. Smolensk State Medical Institute
Glinki ul., 3
Smolensk, RSFSR

Faculty: Therapy
Evening: Therapy
Correspondence: None

60. Stavropol State Medical Institute
Mira ul., 310
Stavropol kraevoi, RSFSR

Faculties: Therapy, Stomatology
Evening: Therapy
Correspondence: Stomatology

61. Sverdlovsk State Medical Institute
Repina ul., 3
Sverdlovsk, RSFSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene
Evening: Therapy, Pediatrics
Correspondence: None

62. Tadzhik State Medical Institute
Lenina prosp., 123
Dushanbe, Tadzhik SSR

Faculties: Therapy, Pediatrics, Stomatology
Evening: None
Correspondence: None

63. Tashkent Medical Institute
Karla Marksa ul., 103
Tashkent, Uzbekistan SSR

Faculties: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology
Evening: Therapy, Pediatrics
Correspondence: Stomatology

64. Tbilisi State Medical Institute
Melikishvili ul., 16
Tbilisi, Georgian SSR

Faculty: Therapy, Pediatrics, Sanitation-Hygiene, Stomatology, Pharmacy
Evening: None
Correspondence: None

65. Ternopol State Medical Institute
Teatral'naia ul., 2
Ternopol, Ukrainian SSR

Faculty: Therapy
Evening: None
Correspondence: None

66. Tomsk State Medical Institute
Moskovskii trakt, 2
Tomsk, RSFSR

Faculties: Therapy, Pediatrics, Pharmacy
Evening: None
Correspondence: None

67. Turkmen State Medical Institute
Shaumiana ul., 58
Ashkhabad, Turkmen SSR

Faculty: Therapy
Evening: None
Correspondence: None

68. Vinnitsa Medical Institute im. N. I. Pirogov
Pirogova ul., 42
Vinnitsa, Ukrainian SSR

Faculties: Therapy, Pediatrics
Evening: Therapy
Correspondence: None

69. Vitebsk State Medical Institute
Frunze prosp., 27
Vitebsk, Belorussian SSR

Faculties: Therapy, Pharmacy
Evening: None
Correspondence: None

70. Vladivostok Medical Institute
Severnyi prosp. 2
Vladivostok, RSFSR

Faculty: Therapy
Evening: None
Correspondence: None

71. Volgograd State Medical Institute
Pavshikh bortsov pl., 1
Volgograd, RSFSR

Faculties: Therapy, Stomatology
Evening: Therapy
Correspondence: None

72. Voronezh State Medical Institute
Studencheskaia ul., 10
Voronezh, RSFSR

Faculties: Therapy, Pediatrics, Stomatology
Evening: Therapy, Pediatrics
Correspondence: Stomatology

Medical Stomatological Institutes

73. Khar'kov Medical Stomatological Institute
Pushkinskaia ul., 53
Khar'kov, Ukrainian SSR

Faculty: Stomatology
Evening: None
Correspondence: None

74. Moscow Medical Stomatological Institute
Kaliaevskaia ul., 18
Moscow, RSFSR

Faculty: Stomatology
Evening: Stomatology
Correspondence: Stomatology

Pharmaceutical Institutes

75. Khar'kov Pharmaceutical Institute
Mel'nikova ul., 12
Khar'kov, Ukrainian SSR

Daytime and Correspondence Faculties.

76. Leningrad Chemical-Pharmaceutical Institute
Popova ul., 14
Leningrad, RSFSR

Daytime and Correspondence Faculties.

77. Perm Pharmaceutical Institute
Lenina ul., 48
Perm, RSFSR

Daytime and Correspondence Faculties.

78. Piatigorsk Pharmaceutical Institute
Kirova prosp., 33
Piatigorsk, RSFSR

Daytime and Correspondence Faculties.

79. Tashkent Pharmaceutical Institute
Karla Marksa ul., 103
Tashkent, Uzbekistan SSR

Daytime and Correspondence Faculties.

80. Zaporozh'ye Pharmaceutical Institute
Minskaia ul., 10
Zaporozh'ye, Ukrainian SSR

Daytime and Correspondence Faculties.

Universities with Medical Faculties

81. Petrozavodsk State University
Lenina prosp., 71
Petrozavodsk, RSFSR

Medical Faculty: Therapy, Pediatric
Evening: Therapy
Correspondence: None

82. Tartu State University
Yulikooli ul., 18
Tartu, Estonian SSR

Medical Faculty: Therapy, Stomatology, Pharmacy, Physical Culture
Evening: None
Correspondence: Stomatology, Pharmacy, Physical Culture

83. Uzhgorod State University
M. Gorkogo ul., 46
Uzhgorod, Ukrainian SSR

Medical Faculty: Therapy
Evening: Therapy
Correspondence: None

84. Vil'nyus State University im. V. Kapsukas
Universiteta ul., 3
Vil'nyus, Lithuanian SSR

Medical Faculty: Therapy, Sanitation-Hygiene
Evening: Pediatric
Correspondence: None

85. Yakutsk State University
Oktyabskaia ul., 33
Yakutsk, RSFSR

Medical Faculty: Therapy
Evening: None
Correspondence: None

Institutes for Advanced Training of Physicians

1. Azerbaidzhan Institute for the Advanced Training of Physicians
Lermontova ul., 68
Baku, Azerbaidzhan SSR

2. Belorussian Institute for the Advanced Training of Physicians
Podlesnaya, 5
Minsk, Belorussian SSR

3. Central Institute for the Advanced Training of Physicians
Vasstaniya Pl., 1/2
Moscow, USSR

4. Kazan State Institute for the Advanced Training of Physicians im. V. I. Lenin
Komleva ul., 11
Kazan, RSFSR

5. Kiev Institute for the Advanced Training of Physicians
Yanvarya 9 ul., 1
Kiev, Ukrainian SSR

6. Leningrad State Institute for the Advanced Training of Physicians im. S. M. Kirov (Order of Lenin)
Saltykova-Shchedrina ul., 41
Leningrad 15, RSFSR

7. Novosibirsk State Institute for the Advanced Training of Physicians
Novosibirsk, RSFSR

8. Odessa Institute for the Advanced Training of Physicians im. A. M. Gor'kii
Odessa, Ukrainian SSR

9. Tashkent Institute for the Advanced Training of Physicians
Parkentskaya ul., 43
Tashkent, Uzbekistan SSR

10. Tbilisi Institute for the Advanced Training of Physicians
Tbilisi, Georgian SSR

11. Stalinsk Institute for the Advanced Training of Physicians*
Voroshilovskoye Shosse, 3
Stalinsk, RSFSR

12. Ukrainian Institute for the Advanced Training of Physicians
Artema ul., 8
Khar'kov, Ukrainian SSR

13. Zaporozh'ye Institute for the Advanced Training of Physicians im. M. Gor'kii
Lenina Prospect, 196
Zaporozh'ye, Ukrainian SSR

Source: Directory of Medical and Biological Research Institutes of the USSR, Public Health Service, Washington, D.C., 1958. PHS Publication # 587.

*Stalinsk has been renamed Novokuznetsk.

Appendix C: Individuals Visited by the Delegation

Moscow

AFANASIEV, CH. YE.
Docent, Chair of Histology and Embryology, First Moscow Medical Institute

BLOKHIN, N. N.
President, USSR Academy of Medical Sciences

BUTROV, V. N.
Vice-Rector, Central Institute for the Advanced Training of Physicians

CHAPLCHUK, M. I.
Deputy Director, Department of Foreign Affairs, USSR Ministry of Health

CHERMAKOV, V. V.
Docent, Chair of Organization of Public Health, First Moscow Medical Institute

EROSTOV, V. S.
Chief, Rayon Health Department

GRUZINSKAIA, N.
Director, Moscow Paramedical School №18

KOCHERGIN, I. G.
Deputy Minister, USSR Ministry of Health

KOVALEVA, E. V.
Professor, Clinic of Children's Diseases, First Moscow Medical Institute

KOVANOV, V. V.
Rector, First Moscow Medical Institute

KURASHOV, S. V.
Minister of Health, USSR Ministry of Health

LABEDEVA, M. N.
Professor and Head, Chair of Microbiology, First Moscow Medical Institute

MAKAROV, V. D.
Department of Foreign Affairs, USSR Ministry of Health

MALINOFSKIY, N.
Chief, Cardiac Surgery, Institute and Clinic of Surgery, First Moscow Medical Institute

MOROZOVA, Z. S.
Associate Director, Moscow Paramedical School №18

NIKOLAEVA, I. F.
Assistant, Chair of Histology and Embryology, First Moscow Medical Institute

ORLOV, D. A.
Department of Foreign Affairs, USSR Ministry of Health

PERELMAN, M. CH.
Chief, Thoracic Surgery, Institute and Clinic of Surgery, First Moscow Medical Institute

PIETROKOLSKIA, L. V.
Chief Physician, Moscow City Hospital №67

RIVKIN, V. L.
Senior Research Assistant, Department of Proctology, Institute of Oncology im. P. A. Gertsen

SHISHOVA, A. M.
Director, Department of Personnel and Higher Education, USSR Ministry of Health

STEPANOV, I. R.
Pro-Rector, Central Institute for the Advanced Training of Physicians

VISHNEVSKIY, A. A.
Professor and Director, Institute of Surgery im. A. V. Vishnevskiy

YALISEYEV, V. G.
Professor and Head, Chair of Histology and Embryology, First Moscow Medical Institute

ZHDANOV, D. A.
Professor and Head, Chair of Normal Anatomy, First Moscow Medical Institute

Leningrad

AGRANOVSKIY, V. M.
Pro-Rector of Research, Leningrad Sanitation-Hygiene Medical Institute

NOTE: Due to the large number of individuals introduced to the Delegation and the brevity of some of the visits, it was not possible to check each name and title for errors or to insure that all names were obtained.

ANDREYEVA-GALANINA, YE. TS.
Professor and Head, Chair of Labor Hygiene and Clinic of Occupational Disease, Leningrad Sanitation-Hygiene Medical Institute

BENOIT, N. N.
Chief, Central Laboratory, Leningrad Sanitation-Hygiene Medical Institute

CHAGAN, YO. B.
Docent, Chair of Labor Hygiene and Clinic of Occupational Disease, Leningrad Sanitation-Hygiene Medical Institute

YAROVYKH, I. I.
Deputy-Dean of Faculty, Leningrad Sanitation-Hygiene Medical Institute

GAVRILOV, S.
Pro-Rector, Leningrad Medical Pediatric Institute

GOLOVIN, D. I.
Pro-Rector of Training, Leningrad Sanitation-Hygiene Medical Institute

IVANOV, A. YA.
Rector, Leningrad Sanitation-Hygiene Medical Institute

KNORRE, A. G.
Professor and Head, Chair of Embryology, Leningrad Medical Pediatric Institute

LEVIN, V. N.
Docent, Division of Pathological Morphology, Central Laboratory, Leningrad Sanitation-Hygiene Medical Institute

MAKSUTOVA, M. KH.
Chief Physician, Leningrad Pediatric Medical Institute

MAKAROV, P. V.
Professor and Head, Chair of Anatomy and Histology, Leningrad University

RUDYEICO, V. A.
Dean of Faculty, Leningrad Sanitation-Hygiene Medical Institute

SINIAVSKAIA, N.
Docent, Leningrad Medical Pediatric Institute

UFLYAND, YU. M.
Professor and Head, Chair of Normal Physiology, Leningrad Sanitation-Hygiene Medical Institute

UGLOV, F. G.
Professor and Head, Clinic of Hospital Surgery, First Leningrad Medical Institute

VASILIEV, V. V.
Acting Director, The Leningrad Electrotechnical Medical School

YACOBSON, G. S.
Acting Director, Leningrad Paramedical School №8

Kiev

APOLISHTCHUK, CH. YA.
Pro-Rector of Research, Kiev Institute for the Advanced Training of Physicians

BAKCHEIVEV, N. S.
Professor and Head, Chair of Obstetrics and Gynecology, Kiev Medical Institute and Rayon Hospital of Kiev

BRATUS, V. D.
Rector, Kiev Medical Institute

BYRUCHINSKIY, G. YA.
Professor and Head, Chair of Therapy, Kiev Medical Institute and Rayon Hospital of Kiev

CHAMAZIUK, A. I.
Chief of Research, Ukrainian Scientific Research Institute of Clinical Medicine im. M. D. Strazhesko

GOTZ, D. V.
Deputy Chief, Department of Higher Education, Ukrainian Ministry of Health

KABAK, K. S.
Docent, Chair of Histology and Embryology, Kiev Medical Institute

KOSTRIUKOVA, K. YU.
Head, Chair of Biology, Kiev Medical Institute

KOZGRENKO, N. F.
Chief, Department of Higher Education, Ukrainian Ministry of Health

MIEFCHYUK, N. A.
Chief Physician, Rayon Hospital of Kiev

MIKHNEV, A. L.
Director, Ukrainian Scientific Research Institute of Clinical Medicine im. M. D. Strazhesko

NOVIK, YE. O.
Docent and Head, Chair of Therapeutic Stomatology, Kiev Medical Institute

POZMOGOV, A. I.
Pro-Rector of Scientific Research, Kiev Medical Institute

SHUMADA, I. V.
Minister of Health, Ukrainian Ministry of Health

SPIROV, M. S.
Professor and Head, Chair of Normal Anatomy, Kiev Medical Institute

VIFTE, N. K.
Vice-Chairman of Scientific Council, Kiev Institute for the Advanced Training of Physicians

ZAZYBIN, N. I.
Professor, Chair of Histology and Embryology, Kiev Medical Institute

Baku

ABASKULIEV, A.
Professor and Head, Chair of Psychiatry, Azerbaidzhan Medical Institute

ABDUROKHMANOVA, S.
Assistant, Chair of Therapy, Azerbaidzhan Medical Institute

ALEKPEROVA, SH. M.
Deputy Minister of Health, Azerbaidzhan Ministry of Health

BAGIROV, A. Z.
Assistant to the Minister of Health, Azerbaidzhan Ministry of Health

BALAKISHIEV, K. A.
Professor and Head, Chair of Normal Anatomy, Azerbaidzhan Medical Institute

CHERNOMORDIK, A. D.
Docent, Chair of Pathological Morphology, City Clinic Hospital №4 and Azerbaidzhan Medical Institute

GASANOV, KH. G.
Rector, Azerbaidzhan Medical Institute

GASANOV, SH. M.
Professor and Head, Chair of Physical Culture and Therapy, Azerbaidzhan Medical Institute

MAMEDOV, B. V.
Deputy Minister of Health, Azerbaidzhan Ministry of Health

MUSABEKOVA, U.
Professor and Head, Chair of Ophthalmology, Azerbaidzhan Medical Institute

SALAIEVA, K. CH.
Director, Azerbaidzhan Para-Medical School №1

VEKILOV, F. M.
Minister of Health, Azerbaidzhan Ministry of Health

Tashkent

AGZAMCHODCHAIEV, S. A.
Director, Institute of Health and History of Medicine

ALIMOV, T. SH.
Head, Emergency Hospital

AMIROV, F. F.
Pro-Rector of Research, Tashkent Medical Institute

BOIKO, V. M.
Deputy Minister of Health, Uzbekistan Ministry of Health

KAMALOV, A. K.
Chief Physician, Hospital and Polyclinic, Tashkent Textile Combine

MAKSUMOV, D. N.
Chief, Research Council, Uzbekistan Ministry of Health

NURUDINOV, M. N.
Chief Pediatrician, Uzbekistan Ministry of Health

ZAIROV, K. S.
Rector, Tashkent Institute for the Advanced Training of Physicians

Novosibirsk

ALESHKINA, A. V.
Deputy Chief, Medical Office, Siberian Division, USSR Academy of Sciences

FROLOV, N. M.
Deputy Mayor, Novosibirsk

FUKS, B. B.
Head, Laboratory of Cytology, Institute of Experimental Biology and Medicine

KAZNACHEEV, L. T.
Professor, Chair of Internal Medicine, Novosibirsk Medical Institute

PONAZDIR, K. I.
Head, Health Department, Novosibirsk

SALGANIK, R. I.
Head, Laboratory of Genetics, Institute of Cytology and Genetics

SOBOLEVA, A. D.
Research Fellow, Laboratory of Cytology, Institute of Experimental Biology and Medicine

SOLOUCHIN, R. I.
Pro-Rector, Novosibirsk University

TROFIMUK, A. A.
Deputy Rector, Science City

VOYEVODSKIY, V. V.
Dean, Faculty of Natural Sciences, Novosibirsk University

ZALESSKIY, G. D.
Rector, Novosibirsk Medical Institute

Appendix D: Notes on Selected Visits

A composite of the notes taken by the members of the Delegation during selected visits are presented in this Appendix to provide the interested reader with some detailed observations. The order of presentation follows that of the text of the report rather than that of the itinerary.

1. REPUBLIC MINISTRIES OF HEALTH

Ministry of Health, Ukrainian SSR

The Ukraine with a population of 44 million has 202 physicians per 100,000 persons. There are 15 medical institutes graduating 6,100 physicians each year. The Republic Ministry of Health plans to increase this figure to 6,600. There are 110 paramedical schools. A ratio of 3.5 paramedical workers for every physician is considered inadequate. The Ministry plans to raise the ratio to 4.5 paramedical personnel for each physician. In contrast with the situation in the remainder of the Soviet Union, 55 percent of medical students in the Ukraine are males.

Ministry of Health, Azerbaidzhan SSR

Health services have been dramatically expanded in this Republic since the Revolution. There are approximately 9,000 physicians for a population of 4,300,000—218 per 100,000. This ratio is even higher in Baku—360 per 100,000 population. Between 500 and 600 physicians are graduated each year from the Republic's single medical institute. There is a total of 38 physicians with the degree of "doctor of medical science" and 377 with the degree of "candidate of medical science."

There are 27,000 paramedical workers—3 for every physician. The Ministry hopes to increase this to 4 for every physician. Approximately 1,200 nurses, midwives, and feldshers were graduated in 1962. This figure was increased to 1,400 in 1963. These individuals are training in 18 paramedical schools in Azerbaidzhan.

The Republic has 34,000 beds, 660 hospitals, 924 outpatient polyclinics, 1,400 feldsher-midwife stations, and 11 research institutes. The budget for health has increased from 83.3 million rubles in 1962 to 89 million rubles in 1963. Specific items in the budget for health are as follows:

1 Medical Institute—2,704,000 rubles
11 Research Institutes—7,700,000 rubles (700,000 rubles each)
18 Paramedical Schools—7,200,000 rubles (400,000 rubles each)

These expenditures for education and research represent almost 20 percent of the health budget. The health budget, which includes pensions and other welfare programs, represents between 30 and 40 percent of the Republic's annual budget.

Ministry of Health, Uzbekistan SSR

This Republic, located on the border of Afghanistan, has experienced vast economic and social development since the Revolution. The population is approximately 9.5 million. There are 13,637 physicians—144 per 100,000 population—and 39,928 paramedical personnel. The Ministry is satisfied with the ratio of 3.5 paramedical workers per physician.

There are 4 medical institutes, 1 institute for the advanced training of physicians, and 11 paramedical schools in the Republic. Approximately 1,400 physicians and between 2,500 and 2,700 paramedical workers were graduated in 1962; 2,182 first-year medical students were admitted the same year. Total enrollment in medical institutes is approximately 10,000. The enrollment in paramedical schools totals 10,500.

Approximately 13 percent of the Republic's budget is spent on health. There are 75,760 beds—9.8 per 1,000 population—1,144 hospitals, 1,546 outpatient polyclinics, 208 tuberculosis clinics, and 3,069 feldsher-midwife stations. By 1965, it is anticipated that there will be 10.2 hospital beds for every 1,000 population.

2. MEDICAL INSTITUTES

First Moscow Medical Institute im. I. M. Sechenov

This is the oldest and largest medical institute in the Soviet Union. It was organized 215 years ago

as the Faculty of Medicine in Moscow University. Prior to 1930 it ranked in last place (in terms of budgetary allocations) among the 15 faculties in the University. Following the shift to the Ministry of Health, enrollment grew from approximately 1,000 to the current enrollment of 7,500. In addition to the student enrollment, there are 500 *ordinators* and *aspirants*.

The institute has 5 faculties—therapy, sanitation-hygiene, and pharmacy (plus evening faculties for therapy and pharmacy). Approximately 80 percent of the evening students and 30 percent of the day students are females. Of the 800 faculty members, 100 are professors. The institute has 25 laboratories and a surgical institute (Petrovskiy). In addition, professors head institutes or laboratories under the USSR Academy of Medical Sciences or the USSR Ministry of Health; over half of the professors head such research enterprises. Sixteen professors are members of the Academy. The Minister of Health, USSR, Professor S. V. Kurashov, holds the chair of organization of public health in the institute.

The institute has 3,000 beds—1 obstetrical clinic, 3 medical clinics, 2 surgical clinics, and 1 pediatric clinic. In addition, the institute uses the clinical facilities of hospitals and polyclinics throughout Moscow.

The Second Moscow Medical Institute was discussed very briefly. This institute has three faculties —therapy, pediatric, and medical biology; the latter was organized in 1962.

Leningrad Pediatric Medical Institute

This institute has 1 faculty. It admits 400 students each year, and graduates between 300 and 400. In addition, 500 paramedical personnel begin evening courses each year. Approximately 60 percent of the students and 30 percent of faculty are females. *Ordinators* and *aspirants* are also prepared.

The faculty includes 32 professors, 46 docents, and 170 to 180 assistants. A total of 3,000 beds is available for teaching purposes; 200 maternity beds and 900 pediatric beds are located in the institute. The remainder are in hospitals and polyclinics in Leningrad.

Leningrad Sanitation-Hygiene Medical Institute

The institute is located on a campus near the outskirts of Leningrad. It has 1 faculty of 39 chairs. There are 6 main specialty areas: (1) hygiene of labor, (2) community hygiene, (3) epidemiology, (4) microbiology, (5) children and adolescents, and (6) nutrition. The faculty totals about 320—43 professors, 78 docents, and approximately 200 assistants.

In addition to a student enrollment of 3,000—50:50 ratio of males to females—there are also 160 *aspirants* and 60 *ordinators*. *Aspirants* are drawn from this medical institute and from university faculties. Approximately one-third of the *aspirants* who are physicians have entered *aspirantura* directly after graduation from the medical institute. These are in the theoretical areas. The *aspirants* and *ordinators* in clinical areas begin their program after 3 years of field experience.

The institute has 1,600 beds on the grounds and another 900 in a city hospital in Leningrad. Clinical facilities for maternity care, psychiatry, and infectious disease are in the city hospital. The Delegation was also shown the central laboratory for interdisciplinary clinical research.

Kiev Medical Institute im. A. A. Bogomol'yets

The institute has 4 faculties—(1) therapy, (2) pediatric, (3) sanitation-hygiene, and (4) stomatology—and comprises 50 chairs. The total enrollment is approximately 4,000. Each entering class has between 500 and 600 students.

Azerbaidzhan State Medical Institute

This institute is one of the largest medical institutes in the Soviet Union. There are 5 faculties: (1) therapy, (2) pediatric, (3) hygiene and sanitation, (4) stomatology, and (5) pharmacy; with a total of 62 chairs, 45 professors, and 75 docents. There are research circles in 45 of the chairs. The teaching is conducted in both Russian and Azerbaidzhan.

The total enrollment is close to 4,000; 650 students are admitted but only about 500 graduate. Three-quarters of the students are from the Republic of Azerbaidzhan. The institute also provides courses to assist applicants in their preparation for the entrance exams. Three-quarters of the students receive stipends of 25 to 35 rubles per month.

The rector of the institute, a psychiatrist, discussed the teaching of his discipline with the Delegation. The chair of psychiatry has two professors and one docent. Students are taught in groups of 10 or less. They examine patients independently but are under the supervision of assistants. The institute uses a 300-bed psychiatric facility for teaching. It was noted that there are 2,800 beds for mental patients in the Republic. (Population—4.3 million)

Tashkent State Medical Institute

The institute was founded in 1919 when a faculty was sent from Moscow to organize a university. Medicine was one of the faculties. The first Uzbek physician graduated in 1925; she is now head of the chair of therapy in the institute.

The institute has 4 faculties—(1) therapy, (2) pediatrics, (3) sanitation-hygiene, and (4) stomatology; with a total of 47 professors, 97 docents, and 300 assistants. Although there are 4 chairs of therapy and 3 chairs of surgery, a single chair of psychiatry—1 professor, 1 docent, and 5 assistants —teaches psychiatry for all faculties.

The undergraduate enrollment is 4,500. In addi-

tion, 30 *ordinators* and 25 *aspirants* are accepted into advanced training each year.

3. PRECLINICAL DEPARTMENTS

Chair of Anatomy, Kiev Medical Institute im. A. A. Bogomol'yets

This chair was founded in 1840. The current occupant is the ninth, and has held the professorship since 1930. Among his predecessors are B. S. Betz (who first described the pryamidal ganglion cells of the cerebral cortex) 1868–90, and F. A. Stefanis, 1903–17. Research is being conducted in the structure of lymphatics, using injection techniques.

There are 50 cadavers available for study by the 600 students in a class. Apparently some cadavers are used for demonstration dissections and other purposes since two groups, with 10 to 12 students in each, use the same cadaver. The Delegation toured three gross anatomy laboratories. A docent or assistant was seen with each group of 10 to 12 students at a dissecting table. Students were also observed in groups of three and four, studying models, dissections, and texts in the anatomy museum.

Chair of Anatomy, Azerbaidzhan State Medical Institute

This chair is staffed by two professors, four docents, and eight assistants. The chair obtains 40 cadavers per year, mostly from hospitals. Gross anatomy is studied in groups of 10 to 12 students, with 2 or more groups using the same cadaver. Cadavers are preserved by formalin-phenol injection, stored in vats with formalin-phenol solution, and kept in cold rooms between dissecting sessions. Comparative anatomy is taught in groups of 25 students. A museum prepared by the staff, charts, and models are used extensively for this subject.

Chair of Anatomy, First Moscow Medical Institute im. I. M. Sechenov

Visited by two members of the Delegation who were very impressed with the quality and originality of some of the research on the circulation and neurosecretion of the hypophysis. Each docent and assistant in the chair completed three dissections annually, for inclusion in the anatomical museum used by the students studying anatomy.

Chair of Biology, Kiev Medical Institute im. A. A. Bogomol'yets

This subject is taught during the first year. The curriculum covers the laws of all living matter. More time is spent studying animal than plant phyla. A tour of 5 laboratory sessions revealed approximately 20 students in each studying the structure of plant cells with the aid of light microscopy.

The professor is assisted by two docents, and three senior and one junior laboratory assistants. Each faculty member is responsible for teaching 24 hours per week. The chair has a "scientific circle," and some students work on a project for all 6 years they are in the medical institute.

Chair of Histology and Embryology, First Moscow Medical Institute im. I. M. Sechenov

The delegation was shown the use of electromicroscopy in research and medical education. Two 1952 model scopes (Tesla, made in Czechoslovakia, and an M2 of Soviet manufacture which resembled a RCA EMU 2) were used for demonstrations to medical students in groups of 15, to acquaint them with the research techniques discussed in textbooks of histology.

An M7 scope, dated 1962, was used for research. Although a resolution of 15-30 Angstroms was claimed, the photomicrographs of bacteria with flagella in dried preparations appeared to show an estimated resolution of only 100 Angstroms. The sophistication of technique and instrumentation appeared of lesser quality than the best work done about a decade ago in the United States.

Chair of Histology and Embryology, Kiev Medical Institute im. A. A. Bogomol'yets

This chair is headed by an academician. The main research interest is concerned with developmental anatomy of the peripheral nervous system. The delegation toured teaching laboratories, each with 15 students and 1 instructor. The students had individual light microscopes to study the cellular structure of the spleen. A projector was used for class review of slides. Models of cellular cleavage and embryogenesis plus specimens of early human embryos are used in teaching embryology. The museum contained a demonstration of the evolution of microscopy.

4. CLINICAL DEPARTMENTS

Institute of Surgery, First Moscow Medical Institute im. I. M. Sechenov

This institute, headed by Professor B. V. Petrovskiy, was completed in mid-1963, and is used for teaching medical students during the fifth and sixth years. There are 5 divisions—general surgery, cardiac surgery, thoracic surgery, vascular surgery, and resuscitation—300 beds, 13 operating rooms, a radiology suite, biochemistry and pathology laboratories for research, auditoriums, classrooms, and clinic examining rooms.

The institute has a staff of 150 scientific personnel, 100 technicians, and 20 engineers. During its tour, the Delegation joined a class of fifth-year students in a large amphitheater to view a black

and white film on the operative treatment of cholecystitis and cholelithiasis. Medical students were also encountered in observation booths overlooking two operating rooms. An assistant was discussing the operation with a group of about a dozen students.

Pediatric Clinic, First Moscow Medical Institute im. I. M. Sechenov

The clinic is headed by Academician Dombrovskaya and has a staff which includes one additional professor, three docents, and six assistants. The clinic provides teaching in pediatrics for fifth-year students from both the faculty of therapy and the faculty of hygiene-sanitation. Students are assigned to the clinic for 1 month each semester. Four subjects are taught: normal systems and prophylaxis, pathology of infants, childhood diseases, and infectious disease. There is an active "scientific circle."

The clinic has 220 beds and handles 50 clinic consultations each day. Children are divided into two age groups—0 to 3 years and 3 to 15 years. In addition to the general division, there are divisions of rheumatic diseases, collagenoses, and respiratory disease (bronchial asthma and pneumonia). Surgical problems are referred to the Petrovskiy Institute.

Chair of Therapy, Kiev Medical Institute im. A. A. Bogomol'yets

This chair is located in the Rayon Hospital of Kiev. It has 430 beds—medicine, 170; obstetrics and gynecology, 170; surgery, 90—and is responsible for the "faculty course" in therapy for medical students in the fourth year. From 4 to 6 groups of 10 students take this course at one time. There are two professors, two docents, and six assistants in this chair. The assistants conduct bedside teaching while the professors and docents lecture. The chair has four *ordinators* taking graduate clinical training and four *aspirants* working for "candidate of medical science" degree.

The curriculum includes two lectures per week and 4 hours of practical work under the supervision of assistants. The students examine patients, write their findings, and then defend their differential diagnosis to the assistants. Observation sessions in a polyclinic and a 2-week full-time assignment on the wards complete the content of this course. The "scientific circle" has between 10 and 12 students.

The chair has 3 divisions and a total of 170 beds. There are four research laboratories and one clinical laboratory for students located on the premises and six research laboratories located in other institutes. The Delegation toured 2 open wards with 30 beds each—1 for male patients and the other for females—several 4-bed rooms, one 3-bed room used for oxygen therapy, and a clinical laboratory equipped with a photometer for doing chemistries.

The chair of introduction to therapy with one professor, three docents, and four or five assistants, teaches third-year students; and the chair of hospital therapy with one professor, three docents and four assistants, teaches fifth- and sixth-year students. These chairs are based in other hospitals. The latter chair is concerned with atypical and rare diseases, and all work is of an inpatient nature.

Chair of Obstetrics and Gynecology, Kiev Medical Institute im. A. A. Bogomol'yets

This chair has a total of 700 beds—105 gynecology beds, 75 maternity beds, 20 radiation therapy beds, and a consultation clinic located in the Kiev Hospital and 500 beds in 3 maternity homes. The maternity homes have their own staffs.

The professor is assisted by four docents and six assistants. In addition, there are seven *aspirants* and four *ordinators*. The teaching program is as follows:

Year	*Lecture*	*Practice*
4th	49 hours	62 hours—examine patients, participate in deliveries and operations, repair episiotomies.
5th	34 hours	34 hours—examine patients in groups of 5 students.
6th	40 hours	200 hours—work fairly independently in a maternity home, responsible to its Chief.

In addition, 2 of the 8 weeks of summer experience between the fourth and fifth years are in obstetrics. During the summer after the fifth year, the student spends 3 weeks practicing obstetrics in one of the larger towns or small cities. A student may perform as many as 100 abortions. During the fourth, fifth and sixth years, the student has 12-hour assignments as "physician on duty" six times each year.

The chair has a "scientific circle" and is conducting research in mechanisms of uterine contraction, coagulability of blood, and biochemistry of the placenta. The delegation toured a nursery for newborns, operating rooms, delivery rooms (three tables in each), and wards.

Chair of Hospital Surgery, First Leningrad Medical Institute

This chair was visited by one member of the delegation. There is currently a clinic of 220 beds. This facility is 100 years old, and is being replaced by new construction scheduled for completion in 1964. The chair will then have 350 beds. The chair has Professor F. G. Uglov, a laureate of the Lenin Prize, as its head and is responsible for instruction of approximately 900 students in hospital surgery each year.

Chair of Hygiene of Labor, Leningrad Sanitation-Hygiene Medical Institute

This chair includes a clinic of occupational diseases. The head of the chair is concerned with the

problems of air pollution. Dust breathing experiments were being conducted with rats as subjects. The apparatus was designed so that particle size and duration of exposure could be varied. Research into the effects of noise was also in progress. Human subjects were seated in a special room and exposed to noise of varying intensity, pitch, duration, and tone. Measurements were subsequently made on perception and auditory function.

Chair of Therapeutic Stomatology, Kiev Medical Institute im. A. A. Bogomol'yets

This is one of three chairs in the faculty of stomatology, Kiev Medical Institute. The other two are surgical stomatology and prosthetics. Some institutes also have a fourth chair—pediatric stomatology. The emphasis of teaching is on preventive dentistry, and the chair is concerned with the problems of fluoridation. It is conducting an epidemiological study in a new community (rayon) across the river from Kiev.

Students begin their clinical work on artificial teeth and then work on cadavers. Following this, groups of four or five students observe the treatment of patients for about 6 months. These groups of students then begin to work on patients under the supervision of a teacher. The delegation toured clinics where patients were being treated by students.

5. HOSPITALS USED FOR CLINICAL TEACHING

Moscow City Hospital #67

This hospital, one of 82 for adults in Moscow, is used for the teaching of surgery, therapy, and gynecology to sixth-year students from the First Moscow Medical Institute. In addition, specialist training under the Central Institute for Advanced Training of Physicians is conducted in rheumatic diseases, radiology, ophthalmology, otolaryngology, and proctology.

The hospital is divided into 4 units—1 pediatric, 1 maternity, and 2 for adult patients—with 32 divisions and 1,600 beds. All services except infectious disease, tuberculosis, dermatology, and psychiatry are included. The neurosurgery service covers seven rayons in Moscow and the ophthalmology service is responsible for eight rayons. The average hospital stay for a first admission is 14 days.

The staff of the hospital consists of 250 physicians and 750 paramedical workers. Each physician is responsible for 15 to 20 beds. The physician's work day ends at 3:00 p.m. Night coverage is provided by 18 physicians. Physicians have night duty 8 nights each month.

A beginning physician earns a salary of 85 rubles a month. It is increased to 95 rubles after 5 years of experience. The top salary for an ordinary physician is 105 rubles a month. Chiefs of service earn an additional 25 rubles a month. Another 15 rubles a month is added for holders of the candidate of medical science degree. Radiologists, psychiatrists, and other specialists receive a bonus equal to 15 percent of their salary, shorter hours of work (5 hours per day), and more holidays (30 working days for radiologists and 48 working days for psychiatrists). These perquisites are provided to compensate for hazards in the work and its complexity. Senior research workers in the hospital receive 250 rubles a month.

The beginning salary for a nurse is 45 to 50 rubles a month; senior nurses receive 75 to 80 rubles a month. The working schedules are such that most nurses work 1½ jobs.

Polyclinic and Hospital, Tashkent Textile Combine

These clinical facilities provide health services for the 18,000 workers and their 26,000 dependents. These are said to include annual check-ups with laboratory examination of blood and urine, and chest X-rays. Workers on the weaving machines receive routine check-ups twice yearly. There are "sanitary-epidemic stations" in each of the eight plants in the combine. These serve as primary screening or detection centers as well as first-aid clinics.

The polyclinic has 89 examining rooms and is open from 9:00 a.m. until 8:00 p.m. Physicians are on emergency call the rest of the time. The hospital has 400 beds—115 therapy and neurology, 70 surgical, 45 gynecology, 55 maternity, and 115 pediatric. There are 107 physicians, 435 paramedical workers, and over 250 supportive personnel in the health department of the textile combine. The surgical and pediatric beds are used by the medical institute for teaching. Also, physicians are assigned by the institute for advanced training to the therapy wards for 5 months of practical work In each case, professors and docents from the institute provide the supervision and do the teaching.

6. INSTITUTES FOR ADVANCED TRAINING

Central Institute for the Advanced Training of Physicians

The Central Institute, founded in 1933, is the largest in the Soviet Union. It coordinates advanced training throughout the USSR and is concerned with advanced training of physicians who aspire to careers as teachers, department heads in hospitals, and leading administrative positions in Health Ministries of the various Republics. The institute also functions as an experimental training center. New ideas are tried out, submitted to the USSR Ministry of Health, and if approved, become standard for other institutes. Consultation on training methodologies is also provided to other institutes.

There are 4 faculties, each headed by a dean, with an academic faculty council of approximately 18 professors. A total of 60 chairs—therapy, 20 chairs; surgery, 16 chairs; sanitation-hygiene, 12 chairs; and medical biology, 12 chairs—is occupied by the institute's teaching staff of 85 professors, 135 docents, and 800 to 900 assistants. The normal teaching load is 540 hours per year, with the remainder of the time for research.

The facilities utilized by the institute include laboratories and 9,000 beds in its clinical chairs, affiliated hospitals, and research institutes. All the hospitals have their own staffs in addition to the teachers from the Central Institute.

The institute has a total of 10,000 physicians enrolled for advanced training. Some 2,000 of these are in correspondence courses, and approximately 500 are in the 2-year *ordinatura* and 3-year *aspirantura*. While the institute is not concerned with the refresher training of general physicians, it does offer short courses for specialists who wish to learn the latest developments in their disciplines.

The organization of the Central Institute for the Advanced Training of Physicians, which is comparable to that of medical institutes, is shown in figure 2.

Ukraine

There are four institutes for the advanced training of physicians in the Ukraine—Kiev, Khar'kov, Odessa, and Zaporozh'ye. In addition, there are faculties for advanced training attached to the medical institutes in L'vov and Donets. Most of these institutes have their own clinical facilities and laboratories, but they also use space in some of the larger hospitals. The faculty spends about 40 percent of their time in research.

These institutes provide both specialist training and refresher training including new techniques of diagnosis or treatment. This latter training is from 1 to 2 months in duration, and focuses on a limited subject area; e.g., vector electrocardiography or cytological screening. There are between 8,000 and 9,000 physicians who receive training in these institutes each year.

Uzbekistan Institute for Advanced Training of Physicians

The institute has 29 chairs and a staff of 16 professors, 42 docents, 84 assistants, 29 senior laboratory assistants, and 42 laboratory assistants. It uses the facilities of 15 city hospitals, 2 maternity homes, a tuberculosis institute, and 12 medical research institutes to provide clinical and research training for approximately 1,400 physicians annually. The institute has a goal of providing refresher training for 8 to 10 percent of the physicians in Uzbekistan each year.

In addition to the short-term courses, the institute has 33 physicians in *aspirantura* and 27 in *ordinatura*. The latter positions are of two types: *clinical ordinatura*, in which the physician has the responsibility for only 6 patients and devotes the majority of his time to research; and *hospital ordinatura*, in which the physician is responsible for a ward of 25 patients.

7. INSTITUTIONS FOR SCIENTIFIC RESEARCH AND TRAINING

Surgical Institute of A. V. Vishnevskiy

This research institute is maintained by the USSR Academy of Medical Sciences. The director of the institute, Professor A. A. Vishnevskiy, is a Colonel General of the Army and Surgeon General to the Armed Forces. His father, a famous surgeon, founded the institute. The institute has a staff of 20 professors and 60 physicians. Medical students are not trained in the institute. However, there are 15 *aspirants* at the institute at present. Physicians from the First Moscow Medical Institute attend a 10-day course designed to advance their competence. The institute cares for 400 patients.

The staff of the institute are currently doing research in five areas: (1) the use of local anesthesia for major surgical procedures; e.g., cholecystectomy, gastrectomy and mitral valvulatomy; (2) the mechanisms of physiological compensation following major surgery; e.g., pneumonectomy and subsequent respiratory center activity; (3) experimentation with extracorporeal circulation in which perfusion with a pump oxygenator is limited to the head and neck, while organs other than the brain are protected by hypothermia; (4) treatment of burns; and (5) application of computers to problems of diagnosis using (a) deterministic models, (b) stochastic models, and (c) cluster analysis.

Scientific Research Institute of Clinical Medicine im. M. D. Strazhesko

The institute was founded in 1936. It receives its budget from the Ukrainian Ministry of Health. Cardiology is the special field of interest in the institute.

There are 105 scientific workers including 8 doctors of medical science and 33 candidates of medical science. In addition, there are 13 *aspirants* and 11 *ordinators*. The total staff, including paramedical and supporting personnel, is 450. There is a total of 275 beds. Only selected patients are admitted. The institute has a referral clinic in which patients from other polyclinics are seen. Occasionally patients with illnesses other than ones being studied by the staff are admitted because of the staff's singular competence with difficult clinical problems.

The institute does not have any regularly scheduled teaching programs for medical students or physicians; however, special courses are developed for physicians from all over the Ukraine who are interested in cardiology. Furthermore, the institute

serves as a base for the Kiev Institute for the Advanced Training of Physicians. The 12 divisions of the institute are as follows: (1) rheumatology, (2) functional pathology, (3) clinical pharmacology, (4) hematology, (5) clinical neurology, (6) hypertensive disease, (7) clinical surgery, (8) pathological morphology, (9) pathological physiology, (10) bacteriology, (11) immunology, and (12) methodology (practical application of new research knowledge)

Science City (Novosibirsk)

The Siberian Branch of the USSR Academy of Sciences was organized in 1957. Subsequently, the construction of a Science City commenced 25 kilometers from Novosibirsk. This was undertaken as part of an effort to stimulate industrial development in Siberia and to utilize more effectively the vast natural resources of the Soviet Union located east of the Urals.

The Science City is a community of 25,000, of whom 12,000 work in the research institutes. Of the scientific workers, there are 26 full members and 11 corresponding members of the USSR Academy of Sciences; 100 doctors of science (doktor nauk); and 400 candidates of science (kandidat nauk).

There are 15 institutes in the *Science City*—(1) mathematics and computer center, (2) hydrodynamics, (3) theoretical and applied mechanics, (4) nuclear physics, (5) thermophysics, (6) solid state physics and semiconductor electronics, (7) automation and electrometry, (8) geology and geophysics, (9) chemical kinetics and combustion, (10) inorganic chemistry, (11) organic chemistry, (12) catalytics, (13) cytology and genetics, (14) experimental biology and medicine, and (15) economics and organization of industrial production. The institutes visited appeared to provide 100,000 square feet of space. In addition, there are 5 research institutes located in Novosibirsk proper—(16) mining, (17) transport energetics (power engineering), (18) chemico-metallurgical, (19) biological, and (20) botanical garden. An experimental farm and factory are also located in the Science City.

The Delegation was shown some first-rate investigations into ultra-structure of mucopolysaccharides and nucleic acids. Collaborative work with the Novosibirsk Medical Institute concerning the use of nucleases to control viruses was described.

Novosibirsk University

The university was established in 1959 and completed the first building on its campus in 1962. Many outstanding academicians and scientists participate in the teaching. The laboratories of the institutes are available to the university for undergraduate and post-graduate students.

The preparation of highly qualified personnel in the fields of mathematics, engineering, chemistry, physics, and biology comprise the primary mission of the university. The 5-year curriculum combines 2½ years of general theoretical studies with 2½ years of preparation in depth in one of the scientific disciplines. The student undertakes independent research work in the latter phase of his program.

There are five faculties in the university—(1) engineering and mathematics, (2) physics, (3) natural sciences, (4) geology and geophysics, and (5) humanities. Two chairs—chemistry and medical biology—constitute the faculty of natural sciences.

The program in medical biology prepares specialists in the disciplines of theoretical and experimental biology and pathology. The student must first master theoretical work in the natural sciences. Subjects studied include mathematics, physics, organic and biological chemistry, biophysics, botany, zoology, pharmacology, microbiology, pathology, cybernetics, histochemistry and immunology.

Students apply to the university after 10 or 11 years of primary and secondary education. There are 2,300 students, of whom 1,600 attend full-time during the day. Approximately 30 percent of the students are from Novosibirsk, 50 percent from the remainder of Siberia, and 20 percent from the rest of the USSR.

There appears to be little connection between the university and the Novosibirsk Medical Institute. Very few medical students participate in any of the investigations in the research institutes. There are no joint appointments of faculty between the university and the medical institute. The Delegation received the impression that the university faculty consider the preparation in the basic sciences to be inadequate in most medical institutes.

8. PARAMEDICAL EDUCATION

Moscow Paramedical School #18

This school is located in the outskirts of Moscow with an adjacent maternity home, "creche," and kindergarten. Clinical training is conducted in various hospitals and polyclinics in Moscow. The director of the school is a physician. The school offers both day and evening courses, and has a total enrollment of 1,000—600 nurses, 200 feldshers, and 200 midwives. A great number of teaching aids are used; e.g., anatomical models, charts, photographs, and mock-ups with which to demonstrate and practice specific procedures; e.g., venapunctures, endotracheal intubation, and application of obstetrical forceps.

The Leningrad Electrotechnical Medical School

This school was established in 1959 to train technicians to install, maintain, and repair medical diagnostic and therapeutic equipment; e.g., EKG, EEG, X-ray machines, diathermy, and Geiger-Muller counters. There are four such schools in the Soviet Union. Technicians of this type are also trained in polytechnical, electrical, radio-technical, and engineering institutes. The graduates of these

programs are employed in hospitals, polyclinics, and research institutes.

The curriculum spans 4 years for students who have completed 7 or 8 years of primary-secondary education and 2½ years for those with 10 or 11 years of preparation. There are evening courses and a correspondence program for individuals who are working full-time. These are of 5 years and 3½ years duration as compared to 4 years and 2½ years of full-time study. The curriculum includes theory, practical work in the laboratory, field experience, and the preparation of a short thesis.

The director of the school is an engineer; most of the 70 faculty members have higher degrees in engineering or science. There are 360 students in an entering day class, of whom less than 2 percent fail to graduate. However, a higher percentage of evening and correspondence students do not complete the program of study. Approximately 80 percent of the students receive stipends.

On graduation, the top 5 percent may apply for higher education in engineering, or other technical institutes. Some graduates, usually women, apply to medical institutes. Others may take correspondence work or continue studies part-time after the 3 years of service. Contrary to the policy in medical institutes, correspondence work or part-time study does not enable the student to begin full-time higher education in an engineering or technical institute in the middle of the curriculum. He must still pursue the regular 4- to 6-year course of full-time study.

Azerbaidzhan Paramedical School #1

This school was founded in 1902, graduated its first class of 4 in 1904, grew to 194 graduates in 1954, and enrolled 443 students in 1962. Lectures are conducted in the school's building, while clinical experience is gained in various hospitals and clinics in Baku. There are separate faculties for day, evening, and correspondence programs. Each teacher is responsible for 720 hours of lecture and supervision of practical work, each year.

The total enrollment is 3,395 students—1,764 full-time day students and 1,631 in the evening and correspondence programs. During 1963, 480 students were admitted to full-time study, 300 to the evening programs, and 200 for correspondence work. The full-time curriculum after 10 or 11 years of primary-secondary education is as follows:

Midwives	2½ years
Dentists	3 years
Dental technicians	2½ years
Nurses	2 years

The courses are proportionately longer for evening and correspondence study and for students who have completed only 7 or 8 years of general education.

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